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Physical Properties of DuPrene Compounds[1]

E. R. Bridgwater[2]

THE purpose of this paper is to compare the physical properties of certain popular types of DuPrene compounds with similarly compounded rubber stocks. The tests reported were conducted on 2 DuPrene compounds, D-10 and D-11, and on 2 rubber compounds, R-10 and R-11. See Table 1. Compounds D-10 and R-10 are pure gum type, containing only those compounding ingredients essential for vulcanization. Compound R-11 is the type commonly used for tire treads, and D-11 is its DuPrene counterpart, both containing 25 volumes of carbon black per 100 volumes of rubber or DuPrene.

[1] Courtesy of *Ind. Eng. Chem.*, Jan., 1934, pp. 33-36.

[2] E. I. du Pont de Nemours & Co., Wilmington, Del.

The 2 DuPrene compounds each contain 2% of the antioxidant, phenyl-β-naphthylamine. This is perhaps the best antioxidant for DuPrene compounds, and 2% of it is completely soluble in DuPrene, both before and after vulcanization. However, this amount of phenyl-β-naphthylamine is not completely soluble in rubber and, if used in rubber, would bloom to the surface after vulcanization. Therefore, an equal weight of phenyl-α-naphthylamine was used in the rubber compounds since it is an equally efficacious antioxidant for rubber and has the advantage of being more soluble in rubber and, consequently, non-blooming.

The DuPrene and the corresponding rubber com-

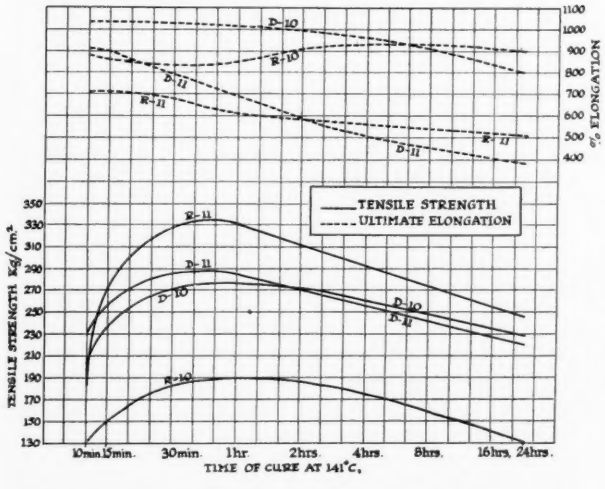


Fig. 1. Tensile Strength and Elongation of Compounds vs. Time of Cure at 141° C.

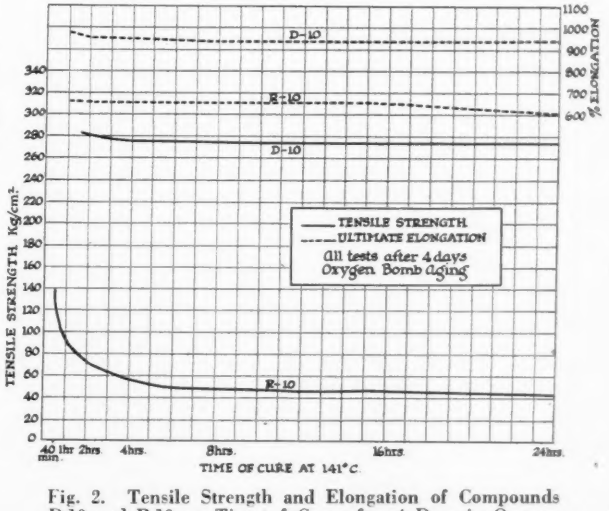


Fig. 2. Tensile Strength and Elongation of Compounds D-10 and R-10 vs. Time of Cure after 4 Days in Oxygen Bomb

pounds also differ in other respects. For example, compound D-10 contains rosin and magnesia, which are desirable ingredients for DuPrene compounds, but are not of particular value in a rubber compound of this type. R-10, on the other hand, contains the accelerator mercaptobenzothiazole, stearic acid, which functions as an activator for the accelerator, and, of course, sulphur.

TABLE 1. COMPOSITION OF DUPRENE AND NATURAL RUBBER COMPOUNDS

	D-10	R-10	D-11	R-11
DuPrene type D	100.0		100.0	
Smoked sheets		100.0		100.0
Channel carbon black			35.0	45.0
Zinc oxide	10.0	5.0	10.0	5.0
Light-calcined magnesium oxide	10.0		10.0	
Phenyl-β-naphthylamine	2.0		2.0	
Phenyl-α-naphthylamine		2.0		2.0
Wood rosin	5.0		5.0	
Sulphur		3.0	1.0	3.0
Mercaptobenzothiazole		0.5		0.7
Stearic acid		1.0		4.0
Pine tar				2.0
Cottonseed oil			3.0	

Curing Range

One of the most desirable properties of a rubber compound is the ability to produce a good vulcanizate over a wide range of time and temperature of vulcanization. This is particularly essential for bulky articles which, on account of the low heat conductivity of rubber, are vulcanized at a higher temperature on the outside than in the center.

Figure 1 shows the tensile strength and elongation of these 4 compounds plotted against time of vulcanization at 141° C. The vulcanizing ingredients have been so proportioned that all 4 compounds reach their optimum cure in approximately 45 minutes. The range of cure of all 4 appears to be good, bearing in mind that the plateau of the vulcanization curves has been foreshortened by plotting the time of cure on a geometrical scale.

It is noteworthy that the addition of carbon black has but little effect on the maximum tensile strength of DuPrene, but nearly doubles the maximum tensile strength of the rubber compound. This behavior is characteristic of DuPrene as compared with rubber.

Aging Properties

One might conclude from study of Figure 1 that rubber has as broad a range of cure as DuPrene, but the fallacy lies in the fact that compounds R-10 and R-11 have poor tear resistance and aging properties when vulcanized more than one hour at this temperature and, when vulcanized for more than 2 hours, would be commercially almost useless.

Figure 2 shows tensile-time and elongation-time curves on compounds D-10 and R-10 after aging in the oxygen bomb for 4 days at 70° C. under 300 pounds per square inch (21.1 kg. per sq. cm.) oxygen pressure. It is possible to compound rubber in such a manner as to make it age better than R-10 when badly overcured, but it is quite impossible to produce a rubber compound whose aging properties will be so completely unaffected by variations in cure as is the DuPrene compound D-10. Neither rubber nor DuPrene is ever cured in such thick masses that the outside of the article gets 24 times as much cure as the center, but the aging properties of the long cures are of practical interest to the extent that they indicate the effect on the aging properties of DuPrene or rubber of prolonged exposure to high temperatures in service.

The general experience of this laboratory with compounds of the R-10 type indicates that the 40-minute cure, which is just short of the optimum tensile, has the best aging properties. Consequently this cure was chosen for further aging tests in the oxygen bomb and in air at 100° C. DuPrene compounds, on the other hand, generally age best when cured to the point of maximum tensile strength, and, as previously shown, prolonging the cure beyond that point causes no deterioration in aging properties. Therefore compound D-10 (cured 60 minutes) was chosen for prolonged oxygen bomb and 100° over-aging tests. The results of the oxygen bomb aging tests are shown in Figure 3. The properties of compound D-10 were affected hardly at all by aging for 28 days; whereas R-10 deteriorated badly in 5 days and retained practically no strength at all after aging 4 days. Results of the 100° oven aging tests are shown in Figure 4. In this test the DuPrene compound deteriorated to some extent, but at a far slower rate than the rubber compound. Again, it should be pointed out that rubber compounds can be produced to withstand this test better than R-10, but no rubber compound can be produced that will withstand oxygen bomb aging as well as properly compounded DuPrene.

Physical Properties of Vulcanizates

Figure 5 shows stress-strain curves on these 4 compounds when cured 45 minutes at 141° C. The DuPrene compounds take up load more rapidly during the early stages of extension, but more slowly toward the end of the extension. This difference is apparently a general characteristic of DuPrene as compared with rubber although a compound may be found that will disprove this generalization.

It is even less safe to draw general conclusions as to the comparative abrasion resistance of DuPrene and rubber because so many different types of abrasion are encountered in service and also because temperature, degree of distortion, etc., have such a profound effect. Consequently no laboratory abrasion test can be relied upon to indicate exactly the difference in abrasion resistances under any given set of service conditions.

A common cause of failure in rubber compounds is flex-cracking. Since this type of deterioration is conceded to be intimately associated with oxidation, it is not surprising to find that DuPrene compounds resist flexing many times better than similarly compounded rubber stocks.

Oil Resistance

One of the most striking differences between DuPrene and rubber is the greater resistance of DuPrene to the swelling and deteriorating action of oils and solvents that have a notoriously bad effect on rubber. The resistance of rubber to these deteriorating influences may be greatly improved by loading it heavily with reenforcing pigments, especially certain types of carbon black. Table 2 shows the formula for a typical oil-resisting rubber stock and for a comparable DuPrene compound containing the same fillers in the same volume relationship. These compounds contain vulcanizing ingredients in such proportions that the DuPrene compound reaches its maximum tensile strength when cured 15 minutes at 141° C., and the rubber compound reaches its maximum tensile strength when cured 5 to 7 minutes at 141° C.

It is well known that the oil resistance of rubber is improved by giving it what is technically known as a very tight cure. Consequently oil immersion tests were run on samples cured 45 minutes at 141° C. The test samples were 2.5 cm. wide, 12.5 cm. long, and 2 mm. thick. These samples were immersed in various swelling media for one week at 28° C. and in some cases at 100° C. Tests were not run at the higher temperature in low-boiling materials such as gasoline, both because they would have little practical value and because of the difficulty and danger of conducting such a test. No test was run in petrolatum at 28° C. because it is a solid at that temperature; consequently it would be difficult to obtain perfect contact of the sample with the swelling medium.

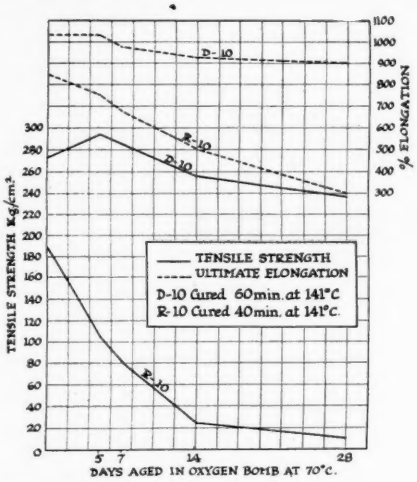


Fig. 3. Effect of Oxygen Bomb Aging on Tensile Strength and Elongation of Compounds D-10 and R-10

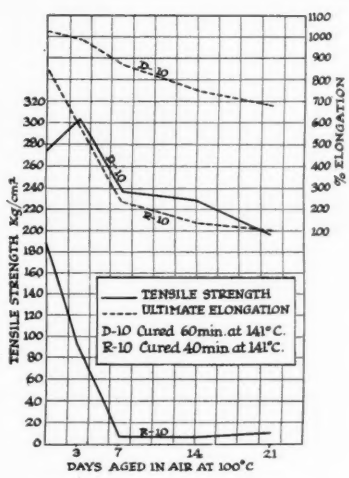


Fig. 4. Effect of 100° C. Oven-Aging on Tensile Strength and Elongation of Compounds D-10 and R-10

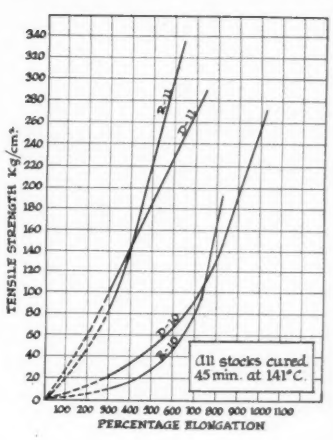


Fig. 5. Stress-Strain Curves of Compounds D-10 and R-10 and D-11 and R-11

The results of these tests are shown in Table 3. It is clear that the higher the temperature the greater is the difference between the degree of swelling of a rubber compound and of a similar DuPrene compound in any given swelling medium. Rubber can be compounded to resist the action of some oils and solvents very satisfactorily at normal temperature, but there is no rubber compound that will not ultimately disintegrate completely when immersed in any petroleum distillate at 100° C.

Table 2. Formulas of Oil-Resisting Stocks

	R-1	D-1
DuPrene	...	100
Smoked sheets	100	...
Soft whiting (40 vol.)	112	85
Gastex (20 vol.)	38	28.5
Glue (10 vol.)	15	11.5
Zinc oxide	10	10
Light-calcined magnesium oxide	...	10
Cottonseed oil	1	2
Stearic acid	1	...
Wood rosin	...	5
Phenyl-β-naphthylamine	...	2
Phenyl-α-naphthylamine	2	...
Sulphur	6	1.5
Du Pont accelerator 808	1	...

Table 3. Effect of Immersing Compounds D-1 and R-1 in Swelling Media for One Week

Swelling Medium	% Increase in Volume			
	At 28° C.		At 100° C.	
	D-1	R-1	D-1	R-1
Saturated petroleum derivatives:				
Casing-head gasoline	9	58	...	...
Kerosene	22	78	37	Dissolved
Paraffin-base motor oil*	1	11	11	150
Pennsylvania crude oil	10	59	21	Dissolved
Petrolatum	...	...	17	178
Unsaturated petroleum derivatives‡				
Mid-continent crude oil	20	61	75	Dissolved
Coastal crude oil	18	54	102	Dissolved
Cracked motor gasoline	33	88	...	...
Benzene†	174	122	...	...
Carbon tetrachloride‡	176	172	...	...
Cottonseed oil	2	15	...	...
Linseed oil	4	7	...	...
Turpentine	88	135	...	...
Lard oil	5	12	...	...

* Hydrogenated lubricants from unsaturated crudes give similar results.
† Toluene, xylene, and solvent naphtha give similar results.
‡ Other chlorinated solvents give similar results.

It has long been known that unsaturated hydrocarbons are somewhat more active swelling agents for rubber than the corresponding saturated hydrocarbons. This is true of DuPrene to a much greater extent than of rubber. It follows that the difference between the swelling of a DuPrene compound and of a similar rubber compound is uniformly greater in saturated than in unsaturated hydrocarbons. In fact, the aromatics, such as benzene which represents the highest possible degree of unsaturation, actually swell DuPrene to a greater extent than rubber at room temperature. It is also true that the difference between compounds D-1 and R-1 is much greater in cottonseed oil which is non-drying than in linseed which is a drying (i. e., unsaturated) oil. Also, turpentine, which has a cyclic structure, swells both DuPrene and rubber quite badly, and the difference between the swelling of DuPrene and of rubber in this medium is relatively slight.

The most important difference between the behavior of DuPrene and rubber in oils and solvents lies not in the degree of swelling, but in the toughness and other physical properties after exposure to the swelling agent. Rubber compounds when badly swollen by oils, etc., become quite tender and tend to slough off in tiny particles. DuPrene compounds have no such tendency even though they may be swollen to 3 or 4 times their original volume. In fact a DuPrene compound such as D-1 will retain approximately half its tensile strength after immersion in kerosene at room temperature for 6 months; whereas a rubber compound such as R-1 will have only about 1/8 its original tensile strength after immersion in kerosene for a few days. Tensile strength after immersion in swelling agents is usually calculated with reference to the original cross-section before immersion, and the preceding statements are based on that method of calculation.

Other Physical Properties

One of the most important properties of rubber is its hysteresis loss or its mechanical efficiency as a medium for storing and releasing energy. Another important and closely related property is its permanent set, which is a measure of the extent to which it fails to return to its original shape after deformation. In general, unpigmented DuPrene stocks containing no sulphur have higher permanent set than sulphur-vulcanized rubber, but the power loss of DuPrene compounds is inclined to be lower than for similarly compounded rubber stocks. Moreover the addition of sulphur to DuPrene compounds tends to reduce the permanent set or cold flow under compression and to reduce the hysteresis loss. These conclusions are purely tentative and must be accepted with caution because the choice of vulcanizing agents and

(*Continued on page* 43)

Pneumatic Rubber Tires on Farm Equipment[1]

Walter B. Jones

THIS paper reviews the results of practical experiments with rubber tires on farm equipment in a number of states during 1933. The following paragraphs outline the outstanding features of this summary.

Low Rolling Resistance

The outstanding characteristics of the low pressure pneumatic tire is its low rolling resistance. Under most conditions of farm usage this is substantially less than that of the alternative steel wheel equipment, the power or draft reduction ranging up to about 60% and approaching 70% in some of the striking comparisons. It seems worthy of mention, in evaluating these studies and in planning others, that the values of rolling resistance seem to vary according to the method of measurement, or rather with the conditions of operation under which measurement is attempted. In at least some soil conditions a wheel advancing by virtue of its own rotation, though free from any external resistance such as drawbar pull, seems to encounter more rolling resistance than when it is towed or pulled by external force. If this is true there is reason to believe that the effect increases as drawbar pull is developed, and that tests with free rolling wheels are no true measure of rolling resistance of tractive wheels.

As a traction member, the rubber tire has, with few exceptions, appeared more efficient, but less effective than the lugged steel wheel. Within its limitations the rubber tire usually delivers more of the developed engine power to the drawbar, due mainly to saving of power by lower loss in rolling resistance. In some conditions, notably in sand, there may be materially less slippage with rubber, as well as lower rolling resistance.

Limitations of Tractive Effort

The limitations of the rubber tire as a traction member are due to the fact that its tractive adhesion is mainly frictional, as compared with the lugged wheel whose engagement with the soil is comparable to that of a spur gear with a rack. On comparatively dry soils of most types the performance of a rubber tire is comparable to that of a rubber belt driving a pulley. There is a small percentage of slip or creep which increases steadily, though slowly, up to a certain point at which total slippage occurs. This point of maximum draft, much more sharply defined, usually occurs at materially lower values, than is the case with lugged wheels.

In such conditions tractive pull available is a function of the force between the frictional surfaces, that is, of weight on the tires. In consequence tractors developed in the direction of light weight are equipped with wheel weights to increase the maximum drawbar pull. Owing to the low rolling resistance this is not, at least on level ground, objectionable.

This combination of limited pull with a rolling resistance which is low, and which seems not to increase sharply with speed, enables the rubber tired tractor to show striking increases in capacity and economy at light and medium pulls at rather high speeds. The economy is apparent at any speed provided the engine is operated at a favorable load factor.

When the moisture in or on the soil exceeds a certain rather critical value, the performance of a rubber driving tire is comparable to that of a rubber belt in a shower. Its tractive effort falls off so sharply and so far as to render it ineffective for practical work. The precise percentage of moisture at which this limitation asserts itself varies with many contributing influences, and in combination with them may be said to constitute the problem for the engineer to solve in determining the application of rubber tires, in the present state of the art, for tractive uses.

Types of Operation

The preponderance of experience is that rubber tires are far superior to lugged wheels in all hayfield work, in nearly every minor as well as major operation. Pretty much the same is true of every type of small grain harvesting work. Not only on the tractor but under the "Combine," the rubber tire has reduced the power requirement, speeded up operation, and in at least some cases has mitigated limiting conditions. In small grain stubble the efficiency and adaptability of the rubber tired tractor extends to plowing or other tillage work.

Barring resistance to the investment cost, the psychology of the user seems to be overwhelmingly in favor of rubber tires for tractors.

The use of low pressure tires on haulage units such as farm wagons or trailers seems to have sufficient advantages and annual use to promise economic justification for rather general adoption throughout the United States. The same may be said as to the ground wheels of field implements or machines with which rolling resistance is a dominating factor in successful operation, or where the product of annual usage with efficiency gain justifies the fixed charges on investment. Standardized, interchangeable wheels used in succession on sundry units might extend the usefulness of rubber tires in this class of service.

Where ground adhesion for traction is required, no such generalization can be made in the present state of knowledge and development. It seems likely that there may be one zone of adaptability for rubber tires and another for lugged steel wheels, as has long been true of the adaptations of chilled and steel plows. To the extent that soil conditions influence the adaptability of rubber tires, there may even be a degree of coincidence in the field of the rubber tire and the chilled plow. It seems certain, however, that the field for rubber tractor tires is large enough to warrant continued and intensive engineering study, and to justify vigorous, though discriminating, commercial exploitation.

[1] A summary of "Pneumatic Rubber Tires on Farm Equipment," *J. Am. Soc. Agri. Eng.*, Feb., 1934, pp. 49-50.

Uses of Latex in Textile Finishing

George D. Kratz and William M. Spencer

THE finishing of textiles embraces a far wider field of endeavor than is generally recognized by those outside the industry. After fabrication into "gray goods" the product must be dyed, printed, stiffened, made water repellent, or subjected to any one of a number of processes required to meet the consumer's specifications.

In some instances the textile manufacturer not only fabricates the cloth, but also finishes it. It is obvious, however, that in many cases it is more economical to prepare the fabric, ship it as an unfinished material or "gray goods," and permit a specialist to finish or convert it into the desired type of final product. For example, a material of a given weight per yard, a certain number of threads per inch, and meeting identical manufacturers' specifications may be required by one purchaser in a certain color with a dull finish and a high degree of flexibility. Another purchaser may desire the same material in a different color, a glossy finish, and very stiff. Such diversity in specifications imposes hardships on the manufacturer and opens up a field of opportunity for the finisher as a specialist along these lines.

The possibilities for latex in textile finishing are great because it is compatible for compounding with most of the substances long used by the trade. These substances include starch pastes, waxes, oils, clays, glues, and other materials which can be employed in water solution or dispersion. Possibly one of the chief advantages in using latex mixtures of the above type is found in the fact that most of the ingredients now utilized are either water soluble or disintegrate on washing. The rubber deposited from the latex, however, acts as a most efficient binder and minimizes the tendency of the size to wash out. Under certain conditions the presence of latex in the mixture markedly assists in the retention of otherwise soluble dyes.

Textile finishing includes such a vast difference in material construction that it is almost impossible to generalize. The variation may be from a thin lacy material to be made water repellent for draperies to the impregnation of heavy canvas for belting. In either instance the degree of impregnation is important, and the difficulties incurred usually increase with the weight or thickness of the material to be treated or the thickness of the coating to be applied. A recent article[1] mentions the possibilities of latex in such widely diversified products as pile fabrics, rug sizing, automobile mats, rugs and carpets, cushions, bath mats, hospital sheeting, suede, and other products. Although some of these materials can hardly be classified under textile finishing, they all represent very definite uses and applications for latex. To differentiate between impregnations and coatings as applied to textiles the following remarks might be of interest.

In the course of some work recently conducted on finishing a light cotton duck for waterproofing purposes, it was thought advisable first to investigate the action of the latex solution on the individual yarn before it was fabricated into cloth. In this instance it was desired that the impregnation of the individual fibers be as complete as possible, the tensile strength of yarn be increased, and the impregnated deposition function to some extent as a lubricant. The latter qualification was specified as inducing a soft pliable texture to the product.

Hauser[2] has stated that the complete penetration of cotton fibers does not occur except in conjunction with the use of a suitable wetting agent and that the effect produced depends upon the point of application. Our experience has been that many good wetting agents are now on the market and these may be applied by many different methods. In the present instance, however, it was found that best results were obtained by first treating the yarn with a 2% aqueous solution of Igepon, drying to a moisture content of approximately 12%, and then immersing in a latex solution of not over 30% solids content containing 2% of Igepon. The yarn was subsequently dried in air at 70° C. or passed through a 5% solution of acetic acid, washed with an alkali such as ammonia, and dried at the same temperature.

The above method, although resulting in the best product obtained at normal temperature and pressure, produced even less convincing results than those obtained by Stevens[3], who found that the rubber film was unevenly deposited on the fibers and showed a tendency toward globular formation rather than a uniform coating. Other wetting agents were tried with varying degrees of success. The only conclusion that could be drawn was that while none of the wetting agents produced the desired results, a better degree of impregnation was obtained with them than without them. It was also found that conducting the impregnation under a steam pressure not exceeding 20 pounds produced still better results, but here again the final impregnation did not meet the specified requirements.

As has been previously mentioned, latex incorporates well with most substances now employed in the sizes generally used in textile finishes. For thorough penetration, wetting agents such as Aresco, Igepon, and Aquarex are sometimes necessary. The function of such substances is not only to remove the size, but also the grease and other foreign substances present and to induce capillary action in the processed "gray goods." Such wetting agents, while efficacious to a certain extent from a practical standpoint, do not seem to reduce the surface tension or the angle of contact to a point where the fiber itself is actually penetrated.

The previous remarks refer to undyed yarn. If the yarn has been dyed prior to treatment with the latex solution, the use of a wetting agent may not be so necessary. This appears to be due both to the action of the usual

[1] "Latex in the Textile Industry," J. Edwardes and J. W. MacKay, *Rayon and Melliand Textile Monthly*, Dec., 1933.
[2] "Impregnation of Textiles with Latex," W. J. R. Hauser, *Rubber Age (N. Y.)*, Jan. 10, 1933, pp. 242-44.
[3] H. P. Stevens, *Bull. Rubber Growers' Assocn.*, Dec., 1933, pp. 653-66.

constituents of the dye bath on the yarn and to the fact that many dye manufacturers now sell their dyes as water pastes and incorporate a wetting agent in them.

From a commercial standpoint it appears probable that it may not always be necessary to effect a complete impregnation of the fiber to achieve improved results. Tensile tests made on the yarn immediately after impregnating, as described, sometimes showed an increased tensile strength of 15% with but a slight decrease in elongation at break. On aging under normal conditions this increase was largely lost; yet in no case did the tensile strength of the treated yarn fall below the untreated control. The deposited rubber appeared to have little, if any, lubricating properties when used alone, but showed decided improvement when other substances of an oily or waxy nature were added to the original mixture.

Applying the same principles to the fabricated duck produced similar results with a somewhat less degree of impregnation depending on the weave. In this connection it should be borne in mind that even though each strand is thoroughly impregnated with the solution unless the interstices between them are filled, the proofed duck will not be impervious to water when subjected to pressure or impact.

Latex solutions can be used to advantage in the production of waterproof or water repellent textiles, but sharp distinction should be made between the 2 specifications. The waterproofing of textiles ordinarily means an absolute figure, as measured by complete lack of penetration of a column of water of definite height impressed on the treated fabric for a certain period of time. This constitutes proofing under the most rigorous conditions and assumes that it will prevail even after usage, washing, or any subsequent treatment to which the fabric may be subjected during its normal life.

Water repellency, however, is not so inclusive. Lace curtains, drapes, and similar materials are sometimes desired which, while treated to repel water or moisture, are not necessarily required to withstand washing or more stringent treatment. Naturally, if the 2 qualifications could be combined, that is, thorough waterproofing to undergo the conditions to which the material is eventually subjected so that the water repellency would not be lost, it would represent the ideal combination.

A rather unusual specification of this type was recently brought to our attention. A latex impregnated dust-cloth was desired which, while containing a minimum amount of moisture, would have the physical characteristics of a wet rag. It was further specified that this condition be maintained even after repeated washing in soap solution. The addition of latex to a mixture somewhat similar to that previously employed resulted in marked improvement, particularly after washing.

At present the required results are not always accomplished, but they can be at least approximated. Latex has one very desirable characteristic evinced by few, if any other, substances. Once deposited on the fabric, it is not under ordinary treatment subject to reversion. This quality permits the inclusion and anchorage of a large number of substances including not only the usual sizing materials, but also antioxidants, disinfectants, and mold preventatives. The use of latex to retain mold and mildew preventatives is attracting special attention at this time.

The preceding comments apply primarily to finishing processes wherein a high degree of impregnation is essential. Further they are based largely on experience with cotton fibers. Strictly speaking, the finishing of textiles involves all types of materials, linen, silk, rayon, and fabrics composed of fiber mixtures. In the finishing of such products thorough impregnation is neither desired nor necessary and under the usual conditions cannot be effected without sacrificing appearance which in most cases is the essential characteristic. For goods of this type light coatings appear to have the greatest possibilities at present.

In most instances it is desirable to employ latex solutions in the finishing of fabrics on existing equipment. Unfortunately this frequently involves the use of a machine which either has copper or bronze rollers or drying cans. If the application can be made on the machine, however, this difficulty is readily overcome by plating the rollers with chromium or other metal which is not subject to attack and which has no influence on the deposited solutions. In one case simply painting a bronze roller with asphalt paint was found to give the desired degree of protection.

The equipment available in most finishing plants is relatively the same. Ordinarily it consists of a solutioning box, fitted rollers, or doctor blades, followed by a series of drying cans or cylinders. Usually the solutioning tank has adjustable rollers and doctors so that a variety of applications can be made with simple alterations. A light coating on one side may be applied in the manner shown in Figure 1. While satisfactory for some purposes, latex solutions as a rule are not readily picked up and applied from a roller surface alone even if a high degree of tension is applied. It will suffice, however, for superficial applications.

When a coating on both sides is desired without thorough impregnation, the solutioning tank may be adjusted as illustrated in Figure 2. From the standpoint of penetration, this gives much more satisfactory results than in the previous instance. Continuing further, modifications of the order illustrated in Figure 3 tend to produce still better results where a more thorough impregnation is required.

In many cases the thickness of the coating is largely regulated by the adjustment of the doctor blades, or rollers, called "nips." If impregnation rather than a coating is desired, the speed at which the machine is run is also a decided factor in the results produced. In most instances such machines seldom operate at a speed over 270 feet per minute, which is sufficiently slow to give the desired effect for light coatings.

The drying factor is most important. Fortunately most machines of the type described are equipped with adequate drying cylinders sufficient to drive off the water in the latex. By decreasing the speed of the fabric over the cylinders, vulcanization can be accomplished coincidently with the drying if desired. Where festoon driers are available the process becomes even more simplified.

The type of solution employed varies for the purpose intended. Where a superficial coating or impregnation only is required, a solution of low viscosity may be applied as described in Figure 1. Where a relatively heavy surface deposition is desired, a solution or paste of high viscosity and solids content may be applied with a doctor blade as shown in Figure 4.

The methods shown in Figures 1 and 4 are virtually the same except that in Figure 1 a light coating is applied from a solution whereas in Figure 4 a paste is used to effect a heavier coating. At high speed with adequate drying facilities available it is sometimes possible to use a latex solution instead of a paste as shown in Figure 4. Also if desired, a light coating may be applied to the reverse side by the use of latex in the solutioning box. Most types of materials treated in this manner, however, do not require the latter procedure.

Fig. 1

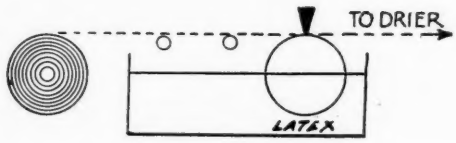


Fig. 2

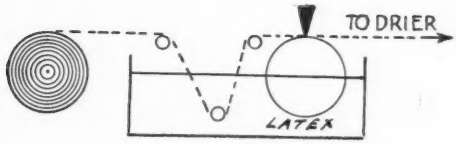


Fig. 3

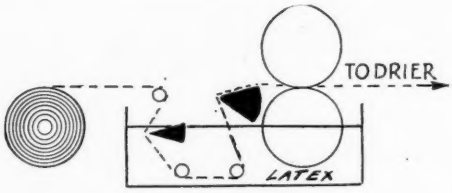
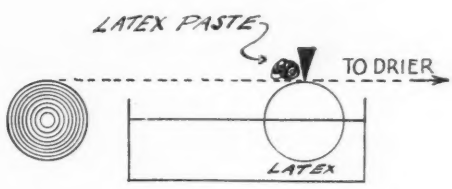


Fig. 4



After the finishing process the textile is frequently subjected to further processing; in the case of pile fabrics even including dyeing in acid solution. Latex coatings and impregnations have been found to stand up well under such stringent treatment. The backing of automobile upholstering, for example, is first coated with a compounded latex solution, dried, and then immersed in a hot acid dye bath for a period up to 4 hours. After this treatment the deposited rubber must withstand an accelerated age test regarded as equivalent to 20 years' normal aging. The fact that such fabrics are produced in immense quantities is the best evidence of the rubber to meet the required specifications.

For textile finishing purposes latex affords an exceptionally good binder, particularly when compounded with substances of an entirely different character. But it is not water repellent in the same sense as paraffin wax. Used alone, latex coatings or impregnations show a tendency to be tacky. This effect is found in improper compounding wherein the water soluble constituents exceed the retentive properties of the latex constituent as a binder. As Stevens[2] has already noted, when properly prepared, a size with a latex base retains after washing almost twice the original amount of sizing material as compared with a latex free size. Under proper conditions and compounding the same tendency has been found to apply to the retention of water soluble colors. In certain instances colored sizes must withstand either moisture or direct contact with water. Latex has been found materially to assist in preventing "bleeding," or the running of color with such mixtures.

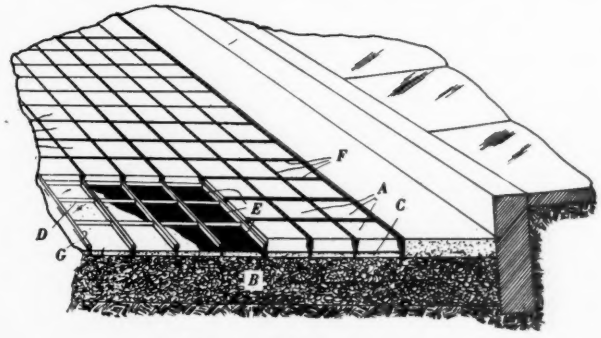
Colored solutions of latex are now being investigated to replace paints used for awning striping. The latex solution can be substituted directly for the paint previously used and has the advantage of being less inflammable, gives a softer product, and ages well. In the past this field of application has been somewhat retarded because of the lack of bright colors. A variety of water soluble dyes now is available which produces good results and with proper compounding gives a fairly glossy finish.

The use of latex by textile finishers will undoubtedly become almost general in the near future. The solutions required may be readily prepared, with the same type of equipment now used in preparing sizes. A good selection of water soluble dyes now appears on the market. With the exceptions already noted latex solutions can be applied on the same finishing machines used for years.

The rubberizing, or proofing, of textiles has long been regarded as strictly a rubber manufacturer's operation. Mostly it was highly specialized, dangerous, and involved the use of expensive solvent recovery plants. With the development of latex solutions, however, the textile finisher has an entirely new field which can be entered with but a minimum capital expenditure. Already a number of finishers are utilizing latex in a small way, and the applications are being constantly extended.

Resilient Block Pavement[1]

THE problem of successfully laying and retaining resilient paving blocks in place on a roadway has proved particularly difficult of practical solution. An effective pavement construction and method for its application is indicated in the illustration. The paving blocks *A*, all of the same dimensions, are made of such resilient material as waste rubber from worn out tires, etc. They are square with sidewalls tapering outwardly at the bottom. The road body for the reception of the blocks is prepared to present a firm foundation upon which is applied a substantial foundation *B* of grit or other desirable construction. Upon this is spread a layer of cement *C* in which is embedded a steel grid *D* having openings of size and shape to receive the paving blocks *A*. These are embedded in a binder coating *E*, spread upon the cement base *C*. After the grid is filled with blocks more binder material is poured into the joints *F* to seal the construction against the entrance of water and to interlock the T-form tops of the longitudinal grid rails *G* with the bevel sides of the paving blocks, thus anchoring the pavement against lifting and retaining the roadway smooth at all times.



Swanson Rubber Pavement

[1] United States patent No. 1,938,644, Dec. 12, 1933.

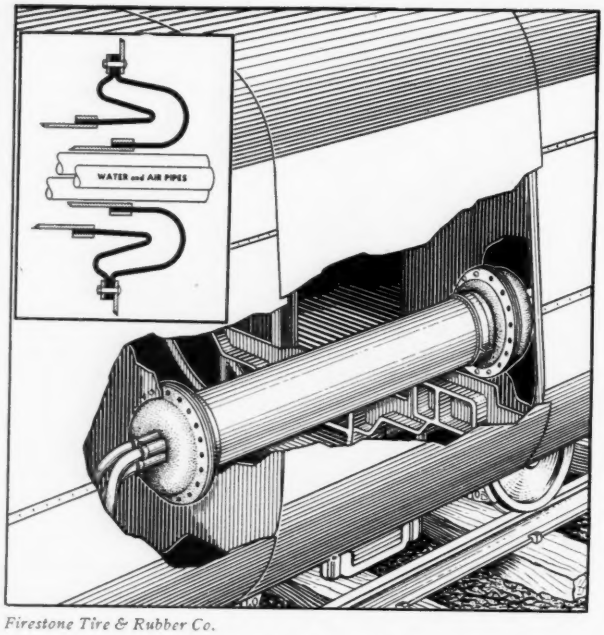
Rubber in High-Speed Passenger Trains[1]

CERTAIN large railway systems centering in Chicago are making significant efforts to recover passenger business for their roads by the introduction of motor driven streamlined high-speed trains. The one here pictured is a 3-car train driven by a 600 h.p., 12-cylinder, distillate-burning engine, with electric transmission. Built by the Pullman Company for the Union Pacific System, it will be operated on special runs between the larger cities on that system to demonstrate its practicability for regular mainline through passenger service.

This train consists of a forward car, 72 feet 8 inches long, containing the power plant, mail compartment, and small baggage room; a second car, 59 feet 10 inches long, with seats for 60 passengers; and a rear car, 71 feet 11 inches long, with a buffet in the rear for serving light meals to passengers in their seats. The overall train length is 204 feet 5 inches, and its estimated weight 170,000 pounds.

The train is about 8 inches narrower and the roof 3 feet lower than in conventional car design. Its reduced cross-sectional area, light weight, streamlined design, and the power plant provided are expected to permit developing a balanced speed of 90 m.p.h. on tangent level track and a maximum speed under favorable conditions of 110 m.p.h.

Liberal use of rubber has been made at many points in the train construction to promote ease of riding characterized by the elimination of shocks, noise, and dust.



Firestone Tire & Rubber Co.

Fig. 1. Streamline Rubber Vestibule and (Insert) Convolution Boot

It is, of course, also used for wire insulation, window wipers, etc.

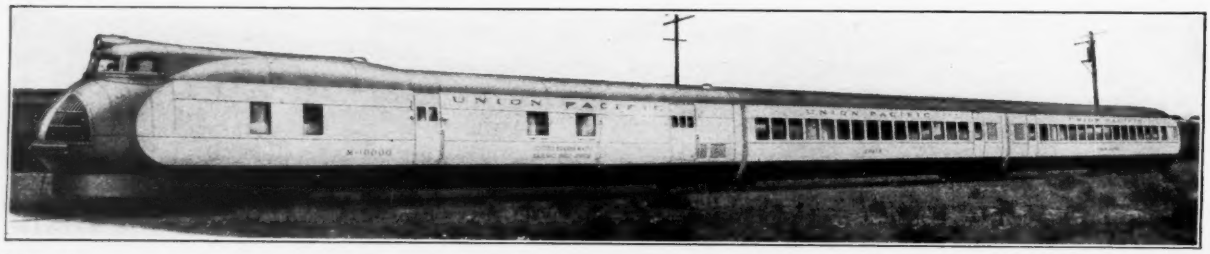
The unbroken streamline of the train between cars is preserved by closing the gap between the hood projection and the following car section by using a rubber vestibule sheet rigidly attached to the following car section. This sheet of a pure gum rubber houses the passageway between cars and by conforming to their shape carries out the perfect streamline contour. Tests of the streamline models indicated that having the passageway thus covered, greatly reduced the total air resistance. The original vestibule was supplied in black rubber, but further developments have enabled its manufacture to be accomplished in yellow, brown, and red colors to match the color scheme of the body of the train.

Another application is shown in the broken-away section and more in detail in the insert of Figure 1. This is the so-called convolution boot giving accordion action to the ends of the heavily insulated conductor tube housing the 3 pipes for air and water between the junction point of the articulated cars, thereby permitting the necessary flexibility required for negotiating curves.

Articulation between body units of the train was adopted as best suiting the requirements for high speed and smooth riding. Articulation is effected by attaching an extension steel casting to each adjoining sill, these castings terminating in center plates which rest one on top of the other. The 2 center plates in turn rest on the truck center plate. Side bearings spaced on each side of the center plates are of special design incorporating the

(*Continued on page* 43)

[1] Data from *Railway Age*, Feb. 3, 1934, and Firestone Tire & Rubber Co., Akron, O.



Railway Age

Fig. 2. Union Pacific 3-Car, High-Speed Passenger Train

Rubber Printers' Blankets

Joseph Rossman, Ph.D.

THE impression cylinders of printing presses, being ordinarily cast-iron, are rigid; consequently their surfaces require a yielding resilient packing or cushion to support the paper while being printed, compensating for errors in the printing plates and causing a uniform printed impression to be made of all points. Such printing plates, particularly the stereotypes used in newspaper printing, are seldom truly cylindrical on their printing surfaces, but usually contain high and low spots which make impossible the production of a uniformly heavy and clear impression, unless the paper is supported in such a yielding and resilient manner that it can give way under the impact of high spots in the plates and is held up in contact with the type faces in the low spots thereof. For this reason it has been the practice to pack or cushion impression cylinders with 2 or more blankets, as they are called, one composed largely of vulcanized rubber, and the other a so-called felt blanket of woven woolen fabric with a long felted nap. These blankets give the resilience and firmness required in the impression member of a rotary press. The rubber blanket is elastic and resilient; while the felt blanket has that balance between firmness and softness required of that part of the packing which comes directly into contact with the paper.

It is customary to overlay the felt blanket with a thin cotton cloth, called a tympan cloth, acting as a blotter to absorb wet ink of the first impression on the paper when passing over the second impression cylinder.

The usual-type blanket is of 2 or 3 plies of textile fabric impregnated with rubber and overlaid by a surface coat of rubber having substantial thickness. Such a blanket, when used on a printing press cylinder, is wrapped about the impression cylinder, with the rubber face outward, and upon it is placed a felt blanket or make-ready sheet which entirely surrounds the rubber blanket and is secured to the cylinder. The paper, while being printed upon, is supported by the covering thus provided on the impression cylinder. Such a covering is necessary because the electrotype and stereotype plates used in printing are sometimes sprung out of shape in casting or bent unevenly in handling. Without a resilient blanket it is impossible to obtain readable impressions from such plates.

The pressure employed in printing and the rotary motion of the cylinders subjected to pressure cause the rubber blanket to stretch and become loose so that after a time the press must be stopped and the slack in the blanket taken up. It is not uncommon for a rubber blanket after a few days' use to stretch as much as an inch on a cylinder 46 inches in circumference. The slackening of the blanket causes the impression on the paper to be poor and is liable to break the paper; while stopping the press to take up the slack in the blankets of all the impression cylinders results in much delay. Again, printing inks contain oil which after a time soaks through the outer felt blanket and attacks the rubber one, absolutely ruining it for further use on the press.

Finally, owing to the high temperature at which press rooms are maintained to keep rollers and ink in the best condition for printing, and to overcome the effects of static electricity, the rubber is oxidized, becomes hard, loses its resiliency, and cracks. All these causes make the useful life of the ordinary printers' blanket very short.

To overcome some of the difficulties enumerated many patents have been granted to inventors. The following survey gives a review of the United States patents on printers' blankets using rubber.

1. Baker, 26,467, Dec. 20, 1859. A rubber printing blanket has roughened selvages or its whole surface roughened to prevent the coloring matter from the printing rollers running or flowing back upon the edges of the fabric printed.

2. McBurney, 26,854, Jan. 17, 1860. The blanket is made with successive layers of canvas or cotton cloth and rubber, then is covered upon one or both sides with a composition of ground fibers and rubber.

3. Taylor, 49,804, Sept. 5, 1865. A printers' blanket consists of a composition of rubber and ground cork applied to a canvas backing.

4. Allen, 148,912, Mar. 24, 1874. The metal plate used as a platen surface in a printing press is backed with a sheet of rubber packing between the platen bed and the metal plate.

5. McBurney, 189,868, Apr. 24, 1877. An endless blanket for printing machines, composed of layers of cloth coated on both sides with rolled layers of vulcanized rubber thicker than the cloth, is arranged to present a fibrous face for the outer surface.

6. Jillson, 202,826, Apr. 23, 1878. Printers' lapping consists of a woolen faced fabric, a thin cotton or linen fabric, and an intervening layer of vulcanized rubber.

7. Campbell, 279,129, June 12, 1883. A fabric for face cloths for printing presses comprises 2 exterior fabrics, as muslin or other similar material, and an interposed fabric of woven wire, the 3 cemented together with rubber and vulcanized.

8. Allen, 613,217, Oct. 25, 1898. In a printing press a tympan contains an auxiliary bed of spring coils interlocked and covered with a sheet of rubber.

9. Allen, 613,218, Oct. 25, 1898. A tympan used in printing comprises a plurality of adjacent spring coils internally braced by rubber.

10. Allen, 613,219, Oct. 25, 1898. A tympan surface consists of coil springs covered with a sheet of rubber.

11. Allen, 613,220, Oct. 25, 1898. This tympan has a base of yielding wires and a superimposed face layer of an independent series of spring coils braced one against the other by the addition of rubber.

12. Allen, 613,221, Oct. 25, 1898. An impression surface or make-ready device for printing presses is composed of a backing and a multiplicity of independent, elastic, and yielding impression members consisting of wire bristles and a yielding bracing of rubber in which the outer ends of the members are embedded.

13. Allen, 629,183, July 18, 1899. In a tympan for

printing presses a hard leveling-sheet has applied to its face a layer of rubber scored to present a series of projections.

14. Hett, 662,862, Nov. 27, 1900. A printing press platen features a support of iron, a base of hard rubber, an inner intermediate layer of continuous soft rubber an outer intermediate layer of sponge rubber, and a continuous facing layer of soft rubber, all integrally united.

15. Hill, 668,919, Feb. 26, 1901. A printing press blanket comprises a layer of sponge rubber of uniform thickness between 2 layers of a rubber-frictioned textile, the layers being vulcanized into a compact structure.

16. Ferguson, 680,577, Aug. 13, 1901. A bed for printing press platens comprises 2 or more sheets of wire gauze laid one upon the other, with the wires of one sheet disposed at an angle to those of the other, an outer sheet of rubber, and means to fasten the sheets together.

17. Bender, 680,752, Aug. 20, 1901. The combination of an impression cylinder wrapped in a rubber blanket, and a separate cover of fabric stretched over it is coated with materials to prevent oil, acid, and the like deleterious matter in the printing ink or paint from reaching the rubber blanket; whereby the blanket is protected, and its life prolonged.

18. Allen, 687,711, Dec. 3, 1901. A tympan fabric for printing is composed of flexible, resilient rubber with an irregular surface formed by adjacent, homogeneous sinuous ribs or wales.

19. Rhodes, 705,294, July 22, 1902. A blanket for the impression member of a printing press consists of a soft rubber flexible backing and numerous small and closely disposed short and comparatively thick integral soft rubber projections, made elastic and of such proportions as to expand transversely when pressure is applied thereto longitudinally. Each projection is independent of and close to the adjacent projection.

20. Rhodes, 752,105, Feb. 16, 1904. A printers' blanket comprises a face of hard vulcanized rubber with a back of inverted pyramidal projections of elastic rubber, whereby the projections may spread laterally under pressure with an increasing resistance until approximately at their limit of compression they may meet to form a solid base, having independent areas of retraction.

21. Sheehan, 839,214, Dec. 25, 1906. A blanket for lithographic presses has a rubber body, a wire passed across it from side to side at intervals, and a supplemental wire passed across the body from end to end at intervals, the turns of the last-named wire extending beyond the body and forming attaching loops.

22. Mascord, 846,040, Mar. 5, 1907. A covering for impression cylinders comprises superposed layers of leather-cloth, rubber, wool, leather-cloth, and cotton.

23. Tessmer, 924,016, June 8, 1909. A blanket for lithographic printing presses consists of a canvas backing, a piece of fabric cemented to the backing, and a rubber impression pad cemented to the fabric, the fabric and the pad being about the size of the sheet to be printed, and the canvas backing being longer, whereby the backing is adapted to be secured to the blanket attaching devices of the press.

24. Cornwall, 1,074,775, Oct. 7, 1913. In an offset printing blanket a perforated metal plate is coated with rubber on both sides.

25. Kush, 1,096,112, May 12, 1914. Rubber printing press blankets are prepared by securing a vulcanized rubber surface member to a backing member, first by treating the back surface of the vulcanized member and one surface of the backing member with a cleaning fluid, then bringing the 2 surfaces into juxtaposition upon a sheet of unvulcanized rubber just treated with a fluid adapted to soften it and render it adhesive, and then subjecting the blankets to uniform pressure between cold rollers.

26. Ellis, 1,096,896, May 19, 1914. A printers' blanket comprises a plurality of textile plies coated and impregnated with rubber, a layer of rubber between 2 of these plies, and a protective facing of fabric coated with an oxidized vegetable oil made independently of the rubber coated and impregnated plies, the latter and the facing being permanently united by calendering and vulcanizing.

27. Gauthier, 1,140,511, May 25, 1915. A blanket for a printing press cylinder is formed by a layer of rubber cushioning material and a pliable sheet metal superposed on it and encasing the edges thereof at the ends of the cylinder.

28. Palmer, 1,147,969, July 27, 1915. A printers' blanket comprises a strip of felt impregnated with a compound composed of 8 parts glue, 2 parts glycerin, 2 parts plaster of Paris, and 2 parts chicle.

29. Haskins, 1,148,381, July 27, 1915. A coating for a printing press blanket includes a mixture of chemically neutralized gelatin, glycerin, and rubber, and an overlying surface coating comprising vegetable gums in solution and a small portion of glycerin.

30. Ellis, 1,158,033, Oct. 26, 1915. A printing blanket comprises a body layer of cork composition, a rubber face layer vulcanized with one face of the body layer, and a sheet of textile fabric united to the opposite face of the body layer.

31. Decker, 1,210,375, Dec. 26, 1916. A printers' blanket comprising a flexible body member has a metallic coating applied to one face.

32. Hoerbelt, 1,211,706, Jan. 9, 1917. Blankets for offset printing presses are made by stretching a thin sheet of rubber and cementing it to one of the faces of a sheet of non-stretchable non-yielding material and applying a sheet of yielding material to the other face of the non-stretchable non-yielding material.

33. Ellis, 1,231,142, June 26, 1917. A packing for the impression cylinder of a printing press comprises a rubber blanket body and a felt blanket body; each of which has a face layer united thereto by an adhesive, and each of the face layers has a coating of nitro-cellulose impervious to oil and repellent to printers' ink, one of the blankets being arranged outside of the other blanket with its ink-repellent coating outward.

34. King, 1,464,716, Aug. 14, 1923. A printers' blanket consists of a sheet of rubber adapted to be secured around the cylinder of a press, having formed on its cylinder engaging face a plurality of cup members projecting entirely beyond the cylinder side of the blanket, having flared openings not extending into the sheet portion of the blanket, and having a continuous border around the edge of the sheet the same height as the cups.

35. John, 1,578,736, Mar. 30, 1926. A printers' blanket has a nitro-cellulose back, a rubber face, a sheet of fibrous material interposed between back and face, and a metal base secured to the nitro-cellulose.

36. DeVries, 1,778,185, Oct. 14, 1930. The rubber surface of a printers' blanket is protected by a coating of phenol resin, hardened during vulcanization.

37. Lewis, 1,846,810, Feb. 23, 1932. A make-ready element is formed by applying to a base a plastic material, then heating the latter under pressure, the material being polymerized, resulting from the reaction of sulphur and a halogenized unsaturated hydrocarbon. The following ingredients are used for the plastic compositions, the proportions being by weight: reaction plastic 100 parts; rubber 20 parts; zinc oxide 10 parts; carbon

black 25 parts; diphenyl-guanidine 0.5-part; accelerator, such as mercaptobenzothiazole 0.2-part; sulphur 0.8-part; plasticizer, such as sulphurized Burgundy pitch 1.0 part; stearic acid 0.5-part; paraffin 0.5-part. The reaction plastic is made by reacting sodium polysulphide and dichlorethylene.

38. Cattran, 1,853,258, Apr. 12, 1932. A printers' blanket is composed of a fibrous base, a thin layer of soft rubber of uniform thickness vulcanized on the base, and an outer layer of relatively hard rubber vulcanized to the soft rubber.

39. Rowell, 1,897,148, Feb. 14, 1933. An offset blanket comprises an impervious sheet metal backing exposed throughout on its under side, a yielding rubber facing secured to an intermediate region of the upper side, the backing extending beyond the ends of the facing and formed on the exposed end with a row of openings adapted to be engaged by attaching means in the press.

40. Calvert, 1,918,517, July 18, 1933. A printers' blanket comprises a heavy woven textile having felted surfaces thereon, rubber coatings upon the felted surfaces, cement coatings upon the rubber surfaces, and an outer coating of regenerated cellulose containing polyglycerol upon the cement.

41. McElroy, 1,924,328, Aug. 29, 1933. Blankets for printing presses are made by vulcanizing rubber to a fabric face, steaming the fabric, treating it with lycopodium, and pressing it.

42. Smith, 1,938,301, Dec. 5, 1933. Printers' blankets are made by preparing a base by cementing and pressing together alternate layers of fabric and rubber sheets, with a fabric sheet forming the top surface of the base, applying a plurality of dope coatings consisting of a gun cotton, castor oil, and rape seed oil solution, each of the coatings being dried at room temperature for 4 to 5 hours, rolling the dope coated base between pressure rolls, then applying a plurality of varnish coatings to the base, the varnish coats being dried at about 150° F. and applied at approximately 18-hour intervals.

Para-Graphs

Non-Rip Surgeons' Gloves. To prevent ripping and otherwise damaging surgeons' gloves when putting on or removing them, the gloves are made with rubber reenforcements at the wrists. The reenforcing pieces are not gummed on to the glove, but are embedded in the rubber.

Sole and Heel Material. A material from which soles and heels can be cut as from leather combines a layer of rubber with one of leather. The layers are roughened on the under side and coated with a suitable adhesive. To prevent premature adhesion the 2 layers are separated by a removable sheet of prepared paper.

Latex in Rug Lining. A special application of latex is that for rendering non-fraying the edges of needled felt fabrics used as lining for rugs. The necessary binding is effected by spraying the edges of the lining with rubber latex or rubber dispersion. This penetrates into the needled fabric and forms a coating of binding material on the edge face of the fabric. If the coating material is self-vulcanizing, it will give a vulcanized edge.

Heat Insulating Tape. Rubber latex composition is employed for waterproofing the outside surface of a sheath of asbestos fabric used as a protective wrapper for large soft rovings of asbestos fibers. This construction is applied around pipes as a spirally wound protective covering that is both heat insulating and waterproof. The waterproofing composition is adapted to effect a watertight joint between the adjacent spiral wrappings when closely wound in place upon a pipe.

Physical Properties of DuPrene

(*Continued from page* 33)

the conditions of vulcanization appear greatly to affect these properties.

Sun checking and corona checking are types of failure of rubber believed caused by ozone. DuPrene can be made to show these effects under severe conditions, but the development of cracks is so slow that under normal conditions DuPrene is not subject to sun checking and is much less subject to corona checking than rubber.

DuPrene is less permeable to gases than natural rubber. This is presumably due to the fact that it contains none of the proteins, resins, and other so-called non-rubber constituents of natural rubber which appear to assist in the diffusion of gases.

Although DuPrene will burn if a sufficiently hot flame is applied, it will not support combustion after the source of heat is removed; whereas natural rubber will. In general it is chemically more stable than natural rubber; by which is meant it is more resistant to oxidation, acids, alkalies, and other chemicals that react on rubber.

Rubber cements are made by swelling natural rubber in gasoline and other solvents. DuPrene cements may be prepared in a similar manner, but the range of available solvents is limited to the aromatic hydrocarbons and the chlorinated solvents such as carbon tetrachloride. DuPrene is not soluble in gasoline and other petroleum fractions, even in the unvulcanized form. DuPrene cements are, in general, better adhesives than rubber cements because unvulcanized DuPrene is tougher and less extensible than unvulcanized rubber, and, moreover, the properties of DuPrene are unaffected by dissolving it and removing the solvent by evaporation; whereas rubber appears to undergo some form of deaggregation.

Since the molecule of chloroprene, of which DuPrene is a polymer, contains a chlorine atom, it is not surprising that DuPrene has a higher specific gravity than natural rubber: namely, DuPrene, 1.21; natural rubber, 0.93.

Rubber in High-Speed Trains

(*Continued from page* 40)

use of rubber in shear to deaden oscillation and contribute their share toward smooth riding. Conditioned air is transmitted through the articulated car connection by flexible bellows.

The truck design is based on extreme cushioning by rubber arranged to take the dynamic rather than the static loads. There are no metallic contacts between the journal box and the truck frame. Thus heavy ring form rubbers are applied with sufficient compression between wing castings and the truck frame so that the rubber has capacity in shear to take its part in supporting the load on the truck. Extreme lateral forces are taken care of by special rubber bushings. The delayed action of the rubber lateral motion device is such that the ordinary gravity return is not reenforced by the rubber return, as this action is a delayed one and takes place considerably later than that produced by gravity.

The chafing plates ordinarily used between truck bolster and transom are present, but are not rigid. A small amount of movement is provided by rubber packing to cushion the movement due to acceleration and deceleration. All coil springs are mounted on rubber pads designed to soften the shocks and kill metallic contact.

The demonstrated value of rubber in the design and construction of this train signalizes a new advance in the acceptance of rubber as an engineering material.

EDITORIALS

Shorter Hours and Wages

THE President asks the rubber manufacturing industry for further reduction in working hours and further increases of the hourly rate of pay. These theories mean higher prices without any doubt whatever. When the power to purchase goods lags behind price increases, the volume of sales declines, and factory orders are reduced. What then—reduce hours and raise wages again?

Paul W. Litchfield, president of the Goodyear Tire & Rubber Co., Akron, O., in a recent radio talk to Goodyear workers stressed the need of eliminating surplus labor by spreading available employment to the greatest possible number. He said in part:

"This can be accomplished only by a further shortening of working periods. When the surplus of labor is taken up, we will have employers bidding for men rather than men bidding for employment. And when that situation arrives, the law of supply and demand will take care of the wage problem so that minima now fixed by law and code will be left far behind.

"Get the idle back to work, and the problem of increased purchasing power is solved. Goods can be produced only at the rate they can be consumed; so, with an increased number of consumers in the market, there will be a steadily increasing rate of production.

"I am well aware of the fact that certain employers are objecting to a further shortening of hours. They object on the ground that they cannot now get the skilled workers they need.

"In registering such an objection they are condemning themselves. With millions of men idle and eager for an opportunity to work, there is no excuse for not giving broader opportunity for the training of all the skilled workers we can possibly use.

"If there are not enough skilled men in the various trades with business now sub-normal, what is going to be the condition when business improves, unless hours are shortened and more men are trained in the meantime? I am disappointed that there exists so much objection to a temporary shortening of working periods while this surplus of labor exists. It is my judgment that the only solution is sufficient elasticity in the hours of work to meet the laws of supply and demand, and at the same time afford employment to substantially all workers able to work. If we are to attain permanent recovery we must ultimately accept such a solution and the sooner the better."

The Wagner Bill

DESIGNED to eliminate strife between labor and industry, the Wagner Bill was introduced in Congress by Senator Wagner of New York, chairman of the National Labor Board. It sets forth the growth of employer-dominated organizations and their failure to comply with the Section 7(a) of the National Recovery Act relating to collective bargaining.

The new bill forbids any employer to influence any organization which deals with problems such as wages, grievances, and hours. They should be covered by a genuine labor union. At the same time the bill does not prevent employers from forming or assisting associations which exist to promote the health and general welfare of workers or to provide group insurance or for similar purposes.

Employer-controlled organizations should be allowed to serve their proper functions of supplementing trade unionism, but they should not be allowed to supplant or destroy it.

The proposed legislation does not resolve the question of the closed-union shop. Such issues should be worked out by labor and industry in the course of experience. But the bill, if enacted, would make it clear that Congress has not intended to foreclose the issue by illegalizing the closed-union shop or by placing any other obstacles in the way of making collective bargaining a working reality.

The refusal of employers to deal with properly chosen representatives has been the cause of many disputes coming before the National Labor Board. The new bill is modeled upon the successful experience of the Railway Labor Act, which provides that employers shall actually recognize duly chosen representatives and make a reasonable effort to deal with them and to reach satisfactory collective agreements.

The Men of the Pit

CLANG of steel against steel, hiss of steam and compressed air, smooth running conveyers, cold tires placed into molds, cured tires piping hot taken out, that's the Pit.

Men, big men, with honest sweat on their brows, men clad in little more than shoes and overalls, men who handle heavy tires and breaking bars with apparent ease, those are the Pit men. *The Wingfoot Clan.*

What the Rubber Chemists Are Doing

A. C. S. Rubber Division Meetings

THE eighty-sixth meeting of the American Chemical Society was held in St. Petersburg, Fla., March 26 to 31, 1934. On this occasion the Rubber Division, Ira Williams, chairman, held 2 half-day sessions. The first of these was in the nature of a symposium, in which 3 phases of the subject were discussed: namely, "The Mechanism of the Action of Organic Accelerators in the Vulcanization of Rubber," by L. B. Sebrell and Winfield Scott; "The Use of Age Resisters for Retarding the Deterioration of Rubber," by Waldo L. Semon; and "The Chemistry of Hard Rubber (Ebonite)," by A. R. Kemp and F. S. Malm.

Abstracts of these papers were not sent out for review because they appeared on the program by invitation. Below are the abstracts of the papers presented at the second session of the Division.

Abstracts

Relation of Volume Change to the Mechanism of Vulcanization of Rubber. Rubber sulphur mixtures increase in density during vulcanization in direct proportion to the amount of sulphur combined. No change in density has been found which would indicate either an increase or decrease in the number of double bonds during vulcanization. The reversion point of rubber during vulcanization at least in certain cases corresponds to the time of practical disappearance of accelerator. Ira Williams.

Presence of Alanine in Rubber Latex. Serum from normal latex obtained by creaming in the usual manner was dried to a thick syrup. This was dissolved in absolute alcohol and amino acids esterified in the presence of dry hydrochloric acid. By fractionation and extraction methods crystalline material with a sharp melting point having 15.5% nitrogen was obtained. This was identified as d-alanine by electrometric titration using glass electrode. The indications are that latex contains about 0.03% of this substance. J. McGavack and J. S. Rumbold.

Method for Determining Flex Cracking in Treads. A method for comparing the flex cracking properties of tread stocks on standard tires which permits the use of laboratory mixed batches is presented. The method can be adapted to the testing of the effect of carcass construction, tread design, etc., on flex cracking. Comparative tests on tires of different make can also be made. Laboratory results check with information obtained from the road. Harold Gray, H. S. Karch, and R. J. Hull.

Los Angeles Group

THE Los Angeles Group of the Rubber Division, A. C. S., held a meeting February 9, 1934, and elected officers for the current year as follows: chairman, Paul Beebe, chief chemist, The Goodyear Tire & Rubber Co. of California; vice chairman, B. E. Dougherty, B. E. Dougherty Co.; and secretary-treasurer, W. R. Hucks, Pacific Goodrich Rubber Co. F. H. Banbury, of the Farrel-Birmingham Co., Ansonia, Conn., addressed the group on some new uses to which the Banbury mixer is being applied.

On March 9 the group held another meeting when Paul Shoaf, manager of the Goodyear Plantations in Sumatra, spoke on the production of plantation rubber.

At an undetermined date, but not later than the first week in April, the group will hold the spring golf tournament which will be conducted on a handicap basis for the Rubber Division Cup and special prizes donated by the National-Standard Co. Negotiations are in progress to hold this tournament at the Rio Hondo Golf Club.

Chicago Group

THE Chicago Group, Rubber Division, A. C. S., will hold its spring meeting in the Hotel Sherman, Chicago, Ill., on April 13, 1934. Dinner will be served at $1.50 each in the College Inn at 6.45 p. m. After dinner the meeting will adjourn to the Crystal Room of the hotel for the remainder of the program. Arthur W. Carpenter, manager of the Testing Laboratories of The B. F. Goodrich Co., Akron, O., will present an illustrated paper entitled "The Measurement of Quality in Rubber Goods by Physical Tests."

New York Group

THE next meeting of the New York Group, Rubber Division, A. C. S. will be held May 18, 1934, in the clubrooms of the Building Trades Employers Association, 2 Park Ave., New York, N. Y. There will be a dinner of unusual excellence, interesting papers, and first-class entertainment. An outing is tentatively planned for some Saturday in June.

Rubber Plants [1]

THE authors' method, while primarily developed for the analysis of guayule, has been applied with success to the investigation of other rubber-producing plants. The difficulties encountered and overcome in developing the method for guayule shrub are no different from those which will arise, to a greater or less extent, in the investigation of rubber-bearing plants in general. The authors are indebted to the Intercontinental Rubber Co. for permission to make public the results of 2 years of intensive study of this problem.

The following is a detailed description of the method as finally adopted for the routine handling of as many as 50 samples a day of guayule shrub by 2 experienced operators.

PREPARATION OF SAMPLE. The plants to be analyzed, washed free of adhering soil, are first coarsely crushed by 2 passes through corrugated differential laboratory mill rolls set up as tightly as possible. This material is then ground successively with a Universal grinder and a corn mill. The use of an attrition-type mill operated with a reciprocating motion for the finer stages of grinding has proved effective in preventing the agglomeration of the rubber in guayule shrub. After each stage of grinding the shrub is thoroughly mixed and quartered by means of Jones ore samplers of various sizes. The final quarter is divided into 2 lots of a little more than 5 g. each and one lot of approximately 10 g. The remaining shrub is preserved, packed tightly in an airtight glass jar, in case of emergency.

Duplicate 5-g. samples are then weighed out on the analytical balance from the small samples divided out with the sampler. These are transferred to Coors porcelain extraction thimbles, which for convenience are 22 mm. in diameter by 70 mm. high, inside measurements, with 2 mm. perforations in the bottom. A thin layer of wool batting is placed below and above the shrub to prevent loss.

The moisture content of the sample is determined at the same time by vacuum-drying the 10-g. sample at 110° C. in a Petri dish.

REMOVAL OF WATER SOLUBLES. The samples in the porcelain thimbles are boiled in a 1% solution of sulphuric

[1] "Determination of Rubber in Rubber-Bearing Plants." By D. Spence and M. L. Caldwell, *Ind. Eng. Chem.* (Analytical Ed.), Nov. 15, 1933, pp. 371-75.

acid for 3 hours. For this operation it has been found convenient to use a monel metal bath provided with a water-sealed lid and water-cooled condenser outlet to maintain the acid concentration. A punched plate is employed to hold the thimbles upright on a monel metal screen. After 3 hours the samples, still saturated with acid, are transferred, along with the supporting tray, to an autoclave where they are steamed for 3 hours at 30 pounds per square inch (2.1 kg. per sq. cm.) pressure.

For the subsequent operation of leaching to remove the materials rendered water soluble by the preceding treatments, a copper bath has been found convenient in which the thimbles are held upright by holes in the lid and are supported on a wire screen 4 cm. from the bottom. Water at 60° C. from a storage-type electric water heater is run through each thimble individually in a slow stream. Three hours of leaching are sufficient completely to remove all water soluble materials. The amount of material thus removed can be determined quantitatively with fair accuracy, by difference, by weighing the thimbles before and after the completed analysis.

ACETONE EXTRACTION. After water leaching, the thimbles are immediately placed in siphon cups of the Underwriters' Laboratories type and are extracted for 12 hours (on an electric hot plate) using about 150 cc. of acetone. If the water solubles are to be determined, as above, this extraction must, of course, be made in a tared flask.

EXTRACTION OF RUBBER. The acetone left in the sample from the preceding operation is first removed by heating the thimbles in the vacuum oven for about half an hour. The rubber is then extracted with 150 cc. of benzene in the usual way. At least 16 hours are required for this operation.

DRYING OF RUBBER. The benzene extract of the shrub is evaporated, dried, and weighed in the same tared flask used for the extraction. Before evaporation 5 cc. of a 0.1% solution of dimethyl-*p*-phenylenediamine in benzene is pipetted into the rubber solution. A correction, based upon a blank determination, is made for this material in calculation of the results. The rubber solution is evaporated on a water bath and then dried to constant weight in a Freas oven at 105° C. Overnight drying has been found very convenient for this last step. The flask is finally weighed to 3 decimal figures. Accuracy to 3 significant figures in the final result expressed as a percentage of the dry weight of the sample has been found sufficient for all purposes.

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Wood Flour

Wood flour is used in compounding such rubber goods as floor tiling, battery boxes, heels, soles, and other molded articles. Its utility is due to its neutral character and floating specific gravity which gives great bulking power. The standard grades range from 30 to 325 mesh. The average of a cubic foot of wood flour in loose bulk is 10.6 pounds. The moisture content varies from 5% in the coarser grades to 3% in the finest.

New Machines and Appliances

Processed Liners

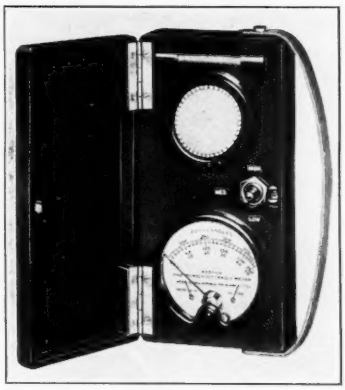
LINERS are fabrics used to separate plies of uncured rubber which otherwise would adhere together or be damaged by accumulation of dust. They are applied at the calender, being wound on the shell at the same time with the rubber sheet. The investment in sheeting and drills employed as liners in any sizable plant well warrants the assignment of factory space and the installation of machinery specially designed for maintaining the fabrics in good condition by freeing them from dust and rolling them smoothly on shells ready for the calender. Before the introduction of the very sticky compositions now employed in tire building, untreated piece goods were generally used as liners. They were inevitably short lived because they became soiled, torn, and accumulated adhering patches of gum in the course of their service which rendered them unsuitable as liners for good stocks. In this condition they were salvaged by being frictioned for use as backing for matting, as cloth insertion plies for cheap packing, or for plies for competition garden hose, etc. If torn into strips, the shorter pieces gave a brief service for cross wrapping hose.

The more efficient practice of recent years has brought the introduction of treated liners. These are the same class of goods as the familiar untreated fabrics. They have, however, been suitably treated to eliminate all loose fibers and leave upon both sides of the goods a film or coating that prevents an adhesive rubber stock from sticking to the treated fabric.

Various materials are employed in the treatment of liners both of fabric and paper. Treated liners are decidedly a step in advance in rubber factory economy and a positive necessity in the handling of soft and sticky friction stocks. The cost of treating liners is amply compensated by their added durability and the increased facility of operation they afford in the calender, the cutting, and the making-up departments.

Light Meter

THOSE versed in the art of illumination are thoroughly familiar with the fact that the productivity of operators varies directly with the illumination under which they work, that accidents and spoilage decrease with higher levels of illumination, and that correct lighting of stores and windows is an important merchandising factor. It is also recognized that low levels of illumination cause eye strain, fatigue, and nervous disorders, resulting in direct loss of individual efficiency.

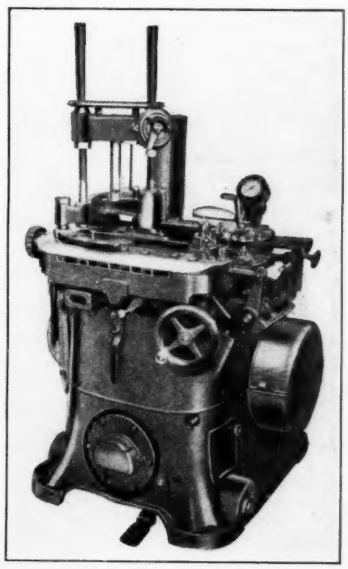


Weston Model 614 Foot-Candle Meter

With the foot-candle meter pictured any user of light can analyze lighting conditions and determine for himself the correct illumination for each particular purpose.

This small, compact instrument readily fits the hand. It is as simple to use as an ordinary pocket rule—is foolproof and directly indicates the light intensities by a pointer moving over an easily read scale.

To measure illumination on a horizontal plane it is only necessary to open the cover, hold the instrument in a horizontal position with the cell or light target lying in its socket, and then take your readings. A 3-way toggle switch is provided to simplify switching to any of the 3 meter ranges so as to give a good scale deflection for any value of light intensity within the maximum range of the instrument. The light target is hinged so that it can be lifted into a vertical position when measuring the illumination on a vertical surface. Weston Electrical Instrument Corp., Newark, N. J.



USMC Outsole Machine

Rubber Soling Machine

A NEW and improved machine for applying outsoles to vulcanized footwear of all kinds, including rubber boots, lumberman's, pacs, and miner's, is here illustrated. It is an individually motor driven, floor type machine, mounted on casters so that it can be moved to any part of the factory or in or out of line without interfering with the normal flow of production. Hydraulic pressure is employed. This pressure can be regulated by a turn of a hand wheel to range from 20 pounds to 150 pounds, thereby insuring a perfect bond of sole to shoe.

In operation, the shoe with the sole properly located is set bottom downward on the top of the series of diaphragms which rest on a cushion of water. The work hold-down members swing into position when the machine is tripped. The totally enclosed pressure chamber insures the diaphragms being forced into contact with all parts of the shoe surface, thereby eliminating air pockets and distortion of the soles at the edge.

A minimum number of hydraulic parts and an automatic force-pump oil-feed to all working parts reduce their wear and the need of service. Working parts are easily accessible for quick adjustment or replacement. From an operating standpoint this machine has a large potential capacity. United Shoe Machinery Corp., 140 Federal St., Boston, Mass.

Full Circle Retreader

TIRE treads wear off long before the carcass shows signs of deterioration; consequently when a good carcass is scrapped because the tread is worn off, virtually 70% of the new tire cost is thrown away. Retreading thus practically restores the tire, making it as good as ever.

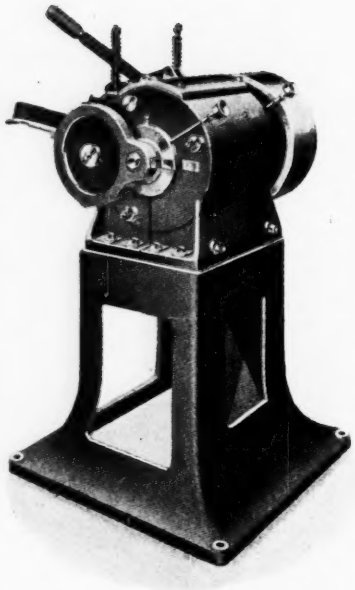
Vulcanization of the new tire tread that replaces the one cut off is accomplished in a steam heated mold of the clam-shell type pictured in the illustration, which represents a truck mold. The so-called clam-shell type of retreading mold is in 2 main sections set horizontally and hinged together with a double hinge. Each section contains a polished steel matrix as represented in the cross-sectional view, which shows the mold assembly closed

around a tire in place for vulcanizing a new tread. The various features of the equipment are indicated individually. In operation the large steam cavity supplies an even flow of heat to all parts of the matrix. Heat is confined to the tread portion of the tire by means of cold side plates. These plates are hollow, through which is constantly circulated a stream of cold water that carries away the heat from the sidewalls of the tire, thus preventing the scarring or the double curing of the sidewalls.

The view shows the tire ready for curing. The tire is mounted upon a road rim, and after the mold is closed and bolted shut the air bag is inflated to the required pressure, forcing the new tread stock into the matrix under an even and constant pressure. The matrix is made in 2 solid halves; therefore the tire is delivered from the mold with a clean-cut tread design that looks like that of a new tire. There are no ridges or scars to mar the appearance; and labor of finishing the tire is reduced to a minimum. American Tire Machinery Co., 738 E. 60th St., Los Angeles, Calif.

Precision Tensiometer

THE illustration represents one of 3 instruments for measuring the surface tension of liquids by the ring method. This is determined in terms of the maximum pull of the liquid on a platinum-iridium ring of given mean circumference when the ring is wet by the liquid and is then slowly detached. These instruments are sensitive torsion balances designed accurately to measure this pull. Since surface tension is usually expressed in dynes, the pull M, indicated by the instrument, must be known in grams, and this value must be multiplied by the acceleration of gravity g. To express the surface tension in dynes per centimeter the product Mg must be divided by the number of centimeters L in the length, that is to say the mean circumference of the ring. Since 2 films acted on the ring, one inside and one out, it is necessary to divide by 2. More concisely expressed, the surface tension in dynes is equal to $Mg \div 2L$. For absolute values of surface tension of the highest precision the model pictured should be used. Central Scientific Co., 460 E. Ohio St., Chicago, Ill.



Waste Rubber Cutter

Soles and Heels from Waste Rubber

A METHOD of molding soles and heels from rubber tire scrap has been perfected in Spain and employs special machines that are of Spanish invention.

The waste rubber is first cut into pieces by the machine shown in the accompanying illustration. It operates with a 2 h.p. motor, producing a ton of cut waste material per hour. The machine receives the material automatically and by means of 2 cylinders, one fluted and the other smooth, delivers the stock cut into ½ cm. (1/5-inch) pieces.

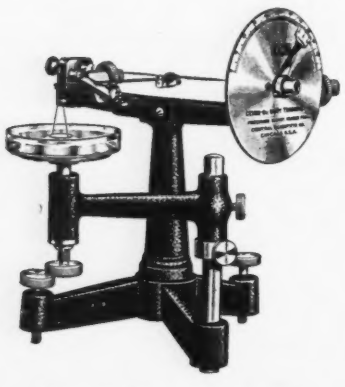
The cut material is then fed automatically to the grinder, which is provided with several revolving and fixed knives. The ground stock is delivered through a sieve which is interchangeable for one of any desired fineness. The output of this machine is from 200 to 250 kilos (440 to 550 pounds) per hour, and the power necessary is 7 h.p.

The product is then fed to the pulverizer, which has an automatic feeding device. Its power consumption is 10 to 12 h.p., and the hourly output is 40 kilos (88 pounds) of black rubber or 80 kilos (176 pounds) of red rubber. The machine is cooled to avoid injury to the finely ground material, which can be perfectly molded by heat and pressure. A special electric and hydraulic press vulcanizer is used for this final step. It is provided with 6 heat adjustments by which higher temperatures can be obtained on this press than with steam. The operation is so simple that any person can use the machine with a few hours' practice. The large model consumes 50 k.w. in 8 hours, and its daily capacity is 1,000 pairs of soles. The small model consumes 22 k.w. in 8 hours and produces 300 pairs of soles.

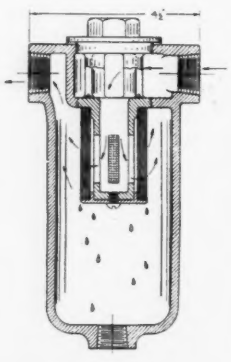
While the data respecting the working of these presses refer to waste rubber, they are also adapted for manufacturing molded articles from crude rubber compositions. Roca & Guix, Barcelona, Spain.

Steam Separator

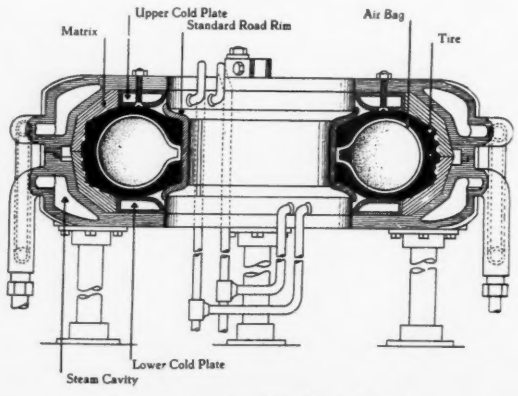
THE illustration herewith represents a separator for steam intended for application on individual steam lines serving heat transfer and process equipment such as presses, cooking kettles, heaters, driers, etc. This separator effects 99% elimination of excess saturation and condensate in the steam when applied immediately adjacent to the point of steam delivery. The moisture laden vapor is zigzagged through several layers of coarse mesh brass screen which effectively baffle and eliminate the water. The comparatively large and effective area of the screen plus the space between ports and screen permit the separator to function also as a strainer for long periods without cleaning. The appliance is made in sizes from ½-inch to 2 inches. The Johnson Corp., Three Rivers, Mich.



Cenco-du Nouy Tensiometer



Gast Separator



Cross-Section of Clam-Shell Mold

New Goods and Specialties

Rubber Rain Capes

THE rubber rain capes born of the Chicago fair last summer undoubtedly were a boon to many women. But the standardized models became so common that many wearers began looking about for something different. Consequently manufacturers decided to put little distinguishing touches to their capes to make them more individual. Here is how the United States Rubber Co., 1790 Broadway, New York, N. Y., varied its models.

Two capes for women are made 42 inches long in white, black, blue, or wine. One style is single ply with a Krepe-Tex collar; while the other is 2-tone with a printed Ascot collar having a Krepe-Tex lining. For misses is offered a 2-tone cape 36 inches long featuring a Krepe-Tex collar. The child's number is 30 inches in length. The colors for the last 2 lots are red, white, and blue.

Yet changing collar and color scheme was not enough. More variety was wanted; so the 2-piece suit came into being. This consists of a wrap-around skirt and finger length cape of 2-tone rubber in white, blue, black, and wine.

The "piece de résistance," however, is the 4-piece ensemble. The wrap-around skirt is plaid; while the short cape is of solid color with a Krepe-Tex lined Ascot collar of matching print. A plaid beret and pouch complete the outfit. The plaids used are blue, green, red and black, and canary and brown.

Latex Balloons

CHILDREN will squeal with delight when they see the world-famous and popular 3 Little Pigs and the Big Bad Wolf as presented in balloon form by The Oak Rubber Co., Ravenna, O. The pigs inflate 7 inches, and the wolf, 15 inches. All are furnished with cardboard feet on which they stand upright. These toys, incidentally, are manufactured from latex by the Anode process.



Vita-Ray Mesh Intercollegiate Athletic Sneex

Spring-Rubber Safety Seat for Swings

SAFETY is an essential factor in the construction of playthings for children, and once again rubber is recognized as having this important quality. Now we find it used in the manufacture of seats for swings as are found in playgrounds.

The EverWear Spring-Rubber Safety Seat, here illustrated, has all outside surfaces, top, bottom, and all edges and ends of special, springy, fabric-reenforced, tubular rubber, corrugated to give a non-slip feature. No metal or other hard surface is exposed. The resilient surface absorbs shocks and presents a soft surface to any chance contact with a child's head or other parts of his body, thus eliminating the possibility of serious injury. This seat, furthermore, is reversible without detachment from the suspensions; top and bottom surfaces can be used to double the life of the seat. It is said also to be neat, attractive, and comfortable. The seat, which weighs 6½ pounds, is claimed to hold 950 pounds. The EverWear Mfg. Co., Springfield, O.



"Who's Afraid of the Big Bad Wolf?"

Rubber in Badminton Shoe

A RECENTLY marketed shoe for badminton, tennis, and squash, particularly, utilizes rubber in several forms in its construction. The smooth corrugated crepe outsole, which does not bite into dirt or clay courts and has positive grip on cement and wood floors, is specially shaped to reduce the total weight of the shoe, to permit close fit around the instep, to hold the arch of the foot up from the floor, and in general to give the greatest comfort and benefit to the user.

A novel feature of the shoe is its mesh upper that allows the excessive moisture of the foot absorbed by the wearer's socks to be given off into the air quickly, thereby making the foot cooler, drier, healthier, and sweeter smelling. This Vita-Ray mesh perforated upper is especially treated with Vultex, which renders it stronger and longer wearing.

The orthopedic heel seat, the metatarsal pad, and the arch support are all molded in the shoe and are fashioned of specially prepared sponge rubber.

Other selling points include the special vamp (toe) construction and the patented Camco ankle support strap.

These Sneex come in white only, for men and women. Cambridge Rubber Co., Cambridge, Mass.

Rubber Crutch Cushion

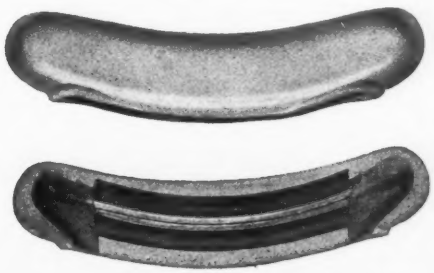
THOSE unfortunates compelled to use crutches frequently found the constant rubbing of the wooden crutch under the armpit adding to their discomfort; consequently rubber cushions were designed to slip over that part of the crutch contacting with the body under the arm. But it was found that cushions with inflatable insides would often deflate and prove irritating.

Now, however, the Tyer Rubber Co., Andover, Mass., offers an improved crutch cushion that is said to eliminate this difficulty. It has a soft rubber outside and an inner sponge rubber pad which increases the comfort of the user.



Pat. App. For

EverWear Rubber Swing Seat



Tyer Cushion for Crutches — Sectional View Showing Sponge Rubber Pad

Rubber Industry in America

OHIO

Goodrich Notes

C. B. O'Connor, general tire sales manager of The B. F. Goodrich Co., recently returned to Akron after leading sales conferences in every section of the country, said business recovery is taking place in some districts without general public recognition. Conferences this year, attended by the Goodrich field sales organization and dealers have been the most enthusiastic in 5 years, he declared.

Dr. H. L. Trumbull, Goodrich director of chemical research, was selected by The National Research Council to prepare a survey on 1933 achievements in rubber chemistry. His paper will be printed in an annual review of chemistry now being compiled.

Edwin B. Newton, of the Goodrich chemical research staff, will leave soon for Singapore to engage in studies of latex and crude rubber preparation in the Far East. Later he is to be joined there by other members of the Goodrich research staff. Although the company has no rubber plantations of its own, its research laboratories in Akron have conducted extensive studies of latex and crude rubber. To these investigations in the Akron laboratories the work of Mr. Newton and his associates in the Far East will be a natural extension of research activities.

A. E. Moon, Goodrich production superintendent of the mechanical division, announced the promotion of 3 foremen to the post of general foremen, effective March 1: W. E. Seldon, general foreman, belting department; C. J. Phillips, general foreman, heels and soles; F. E. Trockle, general foreman, matting running board and superheat packing departments. Mr. Moon also stated H. A. Bourne, general foreman of hose production, was made general foreman of the tubing and channel rubber production departments in addition to his present duties. Mr. Bourne is chairman of the Akron Group, Rubber Division, American Chemical Society.

The company has named 2 new operating managers: Houston, Tex., district, Howard F. Nash, formerly service engineer in the Dallas district; Philadelphia district, H. S. Hunsberger, succeeding L. H. Seidel, assigned to other duties.

J. A. Hoban, general manager of Goodrich Silvertown, Inc., Goodrich's retail sales division, announced the following appointments to store managerships: El Paso, Tex., J. H. Durnal; Portsmouth, Va., A. G. Meginley; Kansas City, Kan., W. R. Dakan, succeeding E. C. Monson, assigned to other duties; Grand Rapids, Mich., C. H. Gamble; Wilkes-Barre, Pa., Wm. F. Reilly, succeeding D. L. Hazeltine, assigned to other duties; San Diego, Calif., John E. Hershberger, succeeding B. B. Morris, assigned to other duties.

Mr. Hoban has also announced the opening of a new Silvertown store in Asheville, N. C., succeeding the Symms Tire Co., with Ernest L. Symms manager.

P. P. Keenan now is credit manager for the New Orleans district. He had been operating and credit manager of the Silvertown store in Dallas.

Dr. Ernest Blaker of the research department was elected president of the general council of the Office Employes Cooperative Plan of the Goodrich company; G. E. Griffin, mechanical goods compounding department, vice president; and A. L. Isenman, commodity costs department, Miller plan, secretary.

The Patterson Foundry & Machine Co., East Liverpool, manufacturer of pulverizing, grinding, mixing, clay working, and processing machinery, has opened an office at Room 406, Basso Bldg., 7338 Woodward Ave., Detroit, Mich. Edwin L. Grimes was named district manager. Louis H. Burkhart, Jr., appointed to handle territory in northern New York state and western Pennsylvania, has his headquarters at Corry, Pa.



General Silent Tread

Goodyear - Sears-Roebuck

The Federal Trade Commission hearing on the Goodyear-Sears-Roebuck tire and tube contract was again opened in Akron, February 19 and continued until the 21st, when it was moved to Cincinnati. After taking testimony for several days the commission moved to Memphis, Tenn., on March 1, where the testimony of independent tire dealers was heard. During March testimony was taken in the Midwest, and on April 9 the hearing will move to Washington, D. C

The Worthington Ball Co., Elyria, at a recent meeting of the board of directors, elected the following officers for the ensuing year: H. M. Naugle, president; J. C. Brydon, vice president; W. E. Reichard, second vice president; C. R. Hallock, secretary and treasurer; E. B. Armstrong, assistant secretary and assistant treasurer.

India Tire Co., Mogadore, the reorganized India Tire & Rubber Co., recently held its first stockholders' meeting at which the following officers and directors were elected: president, William G. Klauss, for many years head of the old company; vice president in charge of sales, C. T. Morledge; treasurer, John T. Fisher; secretary, Stanley Denlinger; directors, the company officers, E. A. Campbell, T. E. Borton, Rufus W. Clark, W. F. Jones, and William S. Boesche, secretary-treasurer of Ornamental Iron Works, Akron. Mr. Morledge for several years and also during its receivership, had charge of the old company's sales; while Mr. Fisher had been assistant treasurer and comptroller and was actively in charge of the former organization's operations under the receiver. F. C. Rogers, formerly in the production department of The B. F. Goodrich Co., Akron, was named superintendent of the India plant. Mr. Denlinger announced a "substantial wage increase affecting all employes and to be in force March 1." The company will manufacture tires and sell them through large dealers and distributers, rather than through branches and company-owned stores.

The General Tire & Rubber Co.'s sales and production officials addressed the sales school held last month at the company offices in Akron on new production developments and new ideas in merchandising. The school, in session for 3 days, was attended by more than 300 dealers and dealers' salesmen. O. S. Johnson, of the sales department, was in charge of the school and presided at the sessions.

EASTERN AND SOUTHERN

Rubber Code News

The Code Authority Conference held in Washington, D. C., March 5 to 7 resulted in a decided shock to the rubber men who attended the meetings. General Hugh S. Johnson's address before the final session included the suggestion of a 10% decrease in hours per week and a 10% increase in wages.

He further said, "We have got to accord labor the rights guaranteed by the Recovery Act. . . I would rather deal with Bill Green, John Lewis, Ed McGrady, Mike MacDonough, George Berry . . . than with any Frankenstein that you may build up under the guise of a company union."

Opinion varied in the trade as to what had actually been accomplished at this conference. To evaluate results now would be premature as the only tangible things done were the appointment of the consumer goods and capital products committees, which are to prepare a program based on the 12 points outlined by the Administrator.

A 30-day extension until April 20 has been granted by the Government for filing a code authority report of the tire manufacturing industry.

The Rubber Manufacturers Association, Inc., has been designated by the NRA administrator to standardize a system of accounting for the tire manufacturing industry.

A. L. Kress and Col. Robert W. Lea, representing the Government as members of the tire code authority, have resigned and are replaced by Oscar Grothe, vice president of the White Sewing Machine Co., now a division of the White Motor Co., Cleveland, O.

Mr. Kress and Milton Katz, representing the Government as members of the general rubber code authority, have resigned and are replaced by Paul G. Chirington.

A. D. Kunze becomes secretary of the divisional code authority for the mechanical goods group and also assistant secretary of the R. M. A. He was formerly assistant to the general manager of the United States Rubber Co.'s mechanicals department, Passaic, N. J.

Pennsylvania Rubber Co. of America, Inc., Jeannette, Pa., owing to increasing demands for its tires, tubes, and tennis and play balls has had to enlarge its production facilities. One large building, a storage plant, has been converted into a great mill in which a new Banbury mixer is being installed. Besides 2 immense machines have been added in the milling room; while 2 additional deep wells have been drilled, and new pumping and cooling equipment put in to afford necessary cooling elements to processing equipment.

Vulcanized Rubber Co., Morrisville, Pa., reports good business in some departments, but declining production in other lines.

General Atlas Carbon Co., 60 Wall St., New York, N. Y., producer of Gastex carbon black, according to Carl J. Wright, vice president and general manager, has completed 2 new producing units at its Pampa, Tex., plant. Because of the increased demand for Gastex during 1933 the company had to extend production facilities twice during the past 6 months. One new unit was completed last July, and 2 more, started last November, are now in operation. Sales of Gastex last year were the largest in the history of the company, being 100% more than the sales for 1932. With the operation of these new production units, all indications are that sales for 1934 will exceed the 1933 record. Gastex, being a soft carbon black, is widely used by the manufacturers of rubber footwear, insulated wire, all-rubber hose, and various types of mechanical rubber goods. The company recently trade marked 2 new carbon black pigments, CS-3 and Pelletex. CS-3, produced from natural gas by the same process that produces Gastex, is a soft carbon black having a high color value, with a blue undertone, for use in rubber compounding, printing inks, paints, varnishes, and other kindred products. Pelletex, a dustless form of Gastex, was designed to meet conditions where dust interferes with production. Both these new blacks were developed in the company's laboratory at the Pampa plant, under the direction of Frank M. Perry, plant superintendent.

Alco Rubber Mfg. Co. of Long Island, 122 E. 42nd St., New York, N. Y., will occupy the building at Park Ave. and 131st St., New York, for the past 30 years occupied by the Goodyear Rubber Co. Louis Alexander, formerly with the Industrial Rubber Corp., will be general manager. Alco will manufacture a general line of rubber products and to specifications. The company finds business good, having many orders for early spring delivery.

St. Joseph Lead Co., 250 Park Ave., New York, N. Y., at a meeting of the board of trustees on March 8 elected E. V. Peters a vice president.

The National Association of Waste Material Dealers, Inc., Times Bldg., New York, N. Y., held its twenty-first annual convention March 19 to 21 at Hotel Astor, New York, N. Y. The meetings concluded with a grand banquet held the evening of the 21st at the Astor. Representatives on all Code Authorities were selected at the meetings of the various Divisional Associations. A conference on "Code Enforcement and the Local Association" took place at the afternoon session of March 19, attended by local, state, and sectional organizations. George Birkenstein, of S. Birkenstein & Sons, Inc., Chicago, Ill., was elected president of the N. A. W. M. D. for the ensuing year.

New R.M.A. Offices

The Rubber Manufacturers Association, Inc., moved on March 19 into new quarters occupying the entire 34th and 35th floors at 440 Madison Ave., New York, N. Y. The reception room is on the 35th floor, where the offices of A. L. Viles, president and general manager, his secretary, assistant secretaries, and the board rooms are located. The offices of the code authority secretaries are on the 34th floor, where also are the accounting department, the statistical department, the mailing and filing rooms.

The increased space and advantages afforded by these new, well appointed and commodious offices will enable the Association efficiently to serve the rubber manufacturing industry in complying with the NRA.

H. Muehlstein & Co., Inc., 41 E. 42nd St., New York, N. Y., will move about April 15 to the Chanin Bldg., 122 E. 42nd St., New York. The Akron, O., address has been changed from 737 First Central Trust Bldg. to Box 189.

The Goodyear Tire & Rubber Co., Akron, O., has appointed M. D. Link, for 3 years night superintendent of the Goodyear Mills, Cartersville, Ga., assistant superintendent of the recently opened mill at Decatur, Ala. He is succeeded by James Knight, formerly overseer of the Cartersville mill's twisting department. Hoyt Green was named to Mr. Knight's former post.

The United States Rubber Co., 1790 Broadway, New York, N. Y., has announced the resignations of Joseph F. O'Shaughnessy as vice president and general manager of the tire division and of L. M. Simpson as general sales manager of the division. Vice President L. D. Tompkins was given Mr. O'Shaughnessy's duties. Howard H. Hawkes succeeds Mr. Simpson. R. P. Rose has been named managing director of all U. S. Rubber manufacturing subsidiaries in Europe. He will maintain headquarters in New York and Paris, France.

The Kelly-Springfield Tire Co., 1775 Broadway, New York, N. Y., at its annual meeting March 16 elected the same directors as last year with 2 exceptions: E. S. Burke and A. F. Eggleston, being new. The board follows: John M. Hancock, Henry S. Bowers, W. M. Flook, J. K. Newman, J. S. Patterson, Byron E. Hepler, Stephen Peabody, Mr. Burke, Mr. Eggleston, and W. H. Lalley. At a directors' meeting the following officers were reelected: Mr. Lalley, president; Mr. Burke, vice president; Mr. Eggleston, treasurer; and H. B. Delapierre, secretary. The following executive committee was appointed: Mr. Newman, chairman, and Messrs. Hancock, Bowers, Flook, Burke, and Lalley.

Herron & Meyer, Inc., has opened a pigment department in its New York, N. Y., office, 82 Beaver St., under the direction of W. A. Herron, brother of John W. Herron, president of the company. Dr. H. A. Flint, formerly Eastern technical sales representative for the Philadelphia Rubber Reclaiming Co., will act as technical consultant for the company's business in the East. Herron & Meyer, in addition to its established crude rubber business, is actively engaged in the sale of such products as Gastex and Palmer carbon blacks, and Crown Brand clay.

MIDWEST

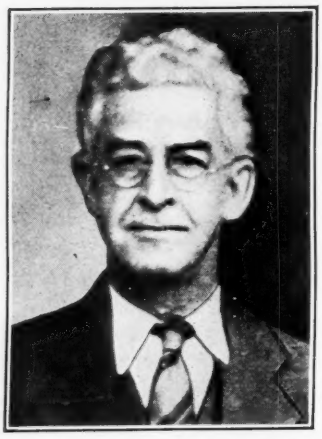
Dryden Rubber Co., with factory at 1014 S. Kildare Ave., Chicago, Ill., and Detroit, Mich., branch at 2-270 General Motors Bldg., according to its president and founder, George B. Dryden, is very busy on dealers' orders and contracts. The firm has a 40-hour week for its men; the plant is now and has been for many weeks running 24 hours daily 6 days a week using 3 shifts daily, making a 5-day week for each employe. With the shorter work-week Dryden needed more help, but the far greater additions to the force are due to the larger orders on hand so that the company has 100% more men at work than during this time in 1933. Thus the present force now is just double that of 1933, with the payroll the largest in the history of the firm. The outlook is for a long run, not only of new equipment but for replacements as well. Much work now is for automobile parts, although practically every Dryden rubber item is selling well on long-time orders, including all molded goods, plumbers' and other mechanicals, electrical tapes, mats and matting, heels and soles, horse shoe pads, hard rubber, refrigerator parts, and specialties. The public is buying; dealers' stocks are low; and the steady rise in the cost of crude rubber is bringing about higher prices.

The Firestone Tire & Rubber Co., Akron, O., this month will move into a new home at Third St. and Pershing Ave., Davenport, Iowa, representing an investment of $120,000. Besides serving as a super-service station and for the merchandising of Firestone products, the new structure will also house Firestone's district offices.

The Mishawaka Rubber & Woolen Mfg. Co., Mishawaka, Ind., in a plan to close by May 1 the plants of the American Rubber Co. in East Cambridge and Malden, both in Mass., is moving their machinery to Mishawaka where the company will manufacture rubberized rainwear, auto topping material, and upholstery cloth. The Indiana firm at present has about 4,000 workers.

Rolle Rubber Co., 296 Broadway, New York, N. Y., through President Edward F. Rolle has announced the removal of its Chicago, Ill., office to 434 S. Dearborn St., where are available increased facilities to make shipments direct to the trade in that territory. R. C. Easley is in charge.

OBITUARY



David A. Ducharme

The Servus Rubber Co., Rock Island, Ill., at the recent annual directors' meeting, reelected Carl A. Hallgren president and retained all old officers. M. E. Streiter was added to the board.

The Process Rubber Plate Co., 610 W. Van Buren St., Chicago, Ill., makes rubber printing plates according to the Gradie Oakes process. The company recently issued a booklet giving samples of this work.

Judsen Rubber Works, Inc., 4101-4111 W. Kinzie St., Chicago, Ill., reports that February, 1934, sales were over 50% greater than sales of February, 1933. Conditions point to a continuance of this increase. New equipment has been added to the press department, including large and small presses. The company specializes in molded rubber products, including molded sponge.

California R. M. A.

Rubbercraft Corp. of California, Ltd., 110-114 E. 17th St., Los Angeles, Calif., through Secretary T. M. Marshall has announced that its president, Charles N. Merralls, was unanimously elected, for a third term, president of the California Rubber Manufacturers Association. T. Kirk Hill, secretary and general manager of Kirkhill Rubber Co., 5801 S. Hoover St., Los Angeles, was named vice president; and J. C. Ballagh, secretary of Patterson-Ballagh, Ltd., Insurance Exchange Bldg., Los Angeles, was elected secretary-treasurer. The association has added to its members the local Goodrich, Goodyear, and Firestone companies. Mr. Marshall also stated that owing to closer cooperation between the various rubber manufacturers, their many marketing problems are being discussed to the benefit of all concerned. The Pacific Coast territory shows increased sales. Western consumers are looking to western manufacturers instead of Akron.

Service Engineer

DAVID A. DUCHARME, Banbury mixer expert and service engineer of the Farrel-Birmingham Co., Inc., Ansonia, Conn., was one of the victims of the wreck of the Pennsylvania Railroad train at Pittsburgh, Pa., on February 26. He was born in Troy, N. Y., February 13, 1877.

In 1917 he joined the engineering department of the Birmingham Iron Foundry, Ansonia, and in 1929 was transferred to the Akron, O., office of Farrel-Birmingham. During his many years' experience in the design and development of the Banbury mixer he also became expert in its operation and was widely known throughout the rubber trade for his skill in starting new installations and working out problems incident to changing over from mill mixing to Banbury mixing.

Mr. Ducharme was a former Grand Knight of Valley Council, Knights of Columbus, a member of Ansonia Lodge, B.P.O.E., and of the Holy Name Society, and an active promoter of Boy Scout activities.

He is survived by his wife, one son, and 3 daughters.

Funeral services were held at Akron, March 2, with interment in Holy Cross Cemetery.

Acme Backing Executive

ON MARCH 11 at his home in Mount Vernon, N. Y., Jacob A. Wasserman, secretary and general manager of the Acme Backing Corp., manufacturer of rubberized fabrics, Brooklyn, N. Y., died of double pneumonia. He was born on December 25, 1886, in New York, N. Y. Mr. Wasserman, who leaves a widow and 2 sons, belonged to the Masons, Elks, and Temple Emanuel.

Funeral services were held March 14 in Mount Vernon. Burial was in Mount Pleasant Cemetery, Mount Pleasant, N. Y.

Kemitex Sales Manager

WHILE on a business trip in Providence, R. I., William Hancock, 37, was killed in an automobile accident on March 16. For many years he was with the Kemitex Products Co., manufacturer of rubberized fabrics, Wadsworth, subsidiary of the Seiberling Rubber Co., Akron, both in O., and more recently was sales manager.

Surviving are his widow and their daughter. Funeral services were held in Mentor, O.

USMC Chairman

AFTER a long illness Edwin Perkins Brown, 65, died of angina pectoris on February 8 at Boca Raton, Fla. At the time of his death he was chairman of the board of the United Shoe Machinery Corp., Boston, Mass., with which he had been associated since 1899, having served also as its president. His father, the late George W. Brown, was one of the company's founders.

FINANCIAL

U. S. Rubber

Net sales of the United States Rubber Co., 1790 Broadway, New York, N. Y., amounted to $88,326,666 for 1933, after the deduction of all discounts and allowances, an increase over 1932 of $10,026,575, or 12.81%. As in previous years sales of tires by controlled companies are not included in the consolidated operations of the company. The profit from operations before deduction of interest on funded indebtedness and provision for depreciation was $10,385,375. After deduction of interest of $3,845,849 and depreciation of $6,462,613 the net profit for 1933 was $76,913. Further charges and credits, not applicable to the current year's operations, caused a charge to surplus for the year of $606,338. The charge to surplus for the year 1932 was $10,358,374.

Total current assets were $50,099,681, December 31, 1933, including cash, $8,054,291. Total current and accrued liabilities were $10,778,827, including $1,357,000 of 6½% serial gold notes maturing March 1, 1934. The ratio of current assets to current liabilities was 4.65 to 1 compared with 3.06 to 1 at the close of the previous year.

The net book value of properties, plants, and equipment on December 31, 1933, was $77,586,572, a reduction of $5,142,149 for the year. Idle properties available for sale had a net book value of $17,879,535. In accordance with the policy adopted in 1932, no depreciation was accrued upon these properties for the year.

The common stock, consisting of 1,464,371 shares of no par value, had a net worth of $12,252,066, on $8.37 a share, after deducting the value of good will, patents, etc., carried on the books of the company.

United States Rubber Plantations, Inc., had a profit of $577,376 before deduction of depreciation of $497,443, which resulted in a credit to surplus of $79,933 for the year. Production for the year was 48,718,000 pounds compared with 48,674,000 pounds in 1932. 99,000 acres are planted, and 82,800 acres are in bearing, with an average yield per acre of 588 pounds.

Fisk Rubber Corp.

The reorganized Fisk Rubber Corp., Chicopee Falls, Mass., covering the period from May 20 to December 31, 1933, showed a net profit after depreciation, federal taxes, and other charges, of $1,279,765. Net sales for the period amounted to $6,422,074.

The consolidated balance sheet as of December 31, 1933, shows total assets of $12,883,805 and total surplus of $6,930,881. Current assets, including $3,278,360 cash and United States certificates, amounted to $8,730,228, and current liabilities were $781,169.

Raybestos-Manhattan

Raybestos-Manhattan, Inc., Bridgeport, Conn., earned net income of $685,198.61 in 1933, equivalent to $1.07 per share, comparing with a net loss of $457,167.39 during the year prior.

Total assets December 31, 1933, were $15,902,843.95, including $7,384,877.83 of current assets, equivalent to 12 times the current liabilities of $609,200.15 at the close of the year. The company had no banking or funded debt or other capital obligations. The book value of its 642,900 shares of stock outstanding, after deducting the 33,112 shares held in the treasury, was $23.79 per share. The net current assets represented $10.54 per share, of which cash and marketable securities amounted to $4.11 per share.

Other Reports

Aetna Rubber Co., Ashtabula, O. For 1933: net loss after depreciation and other charges, $69,059, against $82,001 loss in 1932.

American Hard Rubber Co., New York, N. Y. For 1933: net income, $60,340, equal to $2.66 a share on 22,682 preferred shares, contrasted with net loss of $412,893 in 1932.

Eagle-Picher Lead Co., Chicago, Ill. For 1933: net profit after interest, depreciation, taxes, and other charges, $647,786, equal after 6% preferred dividends, to 68¢ a share on 900,000, $20 par common shares, contrasted with net loss of $805,106 in 1932.

Eagle Picher Mining & Smelting Co., Joplin, Mo., (wholly controlled by Eagle-Picher Lead Co.) and subsidiaries. For 1933: net loss after expenses, bad debts, depreciation, depletion, and other charges, $36,637, compared with $392,527 loss the year before.

Garlock Packing Co., Palmyra, N. Y. For 1933: net income after taxes, depreciation, and other charges, $374,107, compared with $75,221 in 1932.

Goodyear Textile Mills Co., Los Angeles, Calif., (controlled by Goodyear Tire & Rubber Co. of California). For 1933: net profit after taxes and other charges, $135,844, against $134,842 profit in 1932.

Goodyear Tire & Rubber Co. of California, Inc., Los Angeles, Calif., and wholly owned subsidiaries. For 1933: net loss after depreciation, taxes, interest, and other charges, $300,432, against $200,514 loss in 1932.

Intercontinental Rubber Co., 745 Fifth Ave., New York, N. Y. Net loss in year ended December 31, $172,453 after all deductions, compared with net loss of $471,992 in 1932; profit from operations, $26,514, against a loss of $104,919 in 1932.

I. B. Kleinert Rubber Co., 485 Fifth Ave., New York, N. Y. For 1933: net profit after depreciation, taxes, and other charges, $69,718, against net loss of $248,414 in 1932.

Midwest Rubber Reclaiming Co., E. St. Louis, Ill., (controlled by Akron Rubber Reclaiming Co., Barberton, O.) Year ended October 31, 1933: net loss, $18,554, against $81,047 loss in preceding fiscal year.

National Rubber Machinery Co., Akron, O. For 1933: net loss after taxes, depreciation, interest, and other charges, $57,763, against $210,949 loss in 1932.

Servus Rubber Co., Rock Island, Ill. For 1933: net profit of $49,633.27; gross profit, $472,497; reduction in loans, $160,000; with $329,911, shown as the gross profit for 1932.

New Incorporations

The Allyn Rubber Products Co., Akron, O., Feb. 7. J. R. Latta, E. L. Houbert, and V. Wees. Manufacture and distribute a varied line of rubber products.

Ayvad Water Wings, Inc., 1021 Grand St., Hoboken, N. J. Capital 100 shares, no par value. H. A. Ayvad, R. H. Oetting, and E. Riordan, all of Hoboken. Manufacture rubber water rings, life preservers, bags, and belts.

Bagfair, Inc. (N. Y.), Jan. 25, capital $15,000. M. Greenberger, 152 W. 42nd St., New York, N. Y. Leather and rubber goods.

Paul Coste, Inc., Providence, R. I. Capital $30,000, divided into 300 shares of preferred stock, par value $100, and 325 shares, no par. P. Costè, J. C. Knowles, and J. B. Littlefield. Manufacture and handle rubber products.

Sav-U-Cuts, Inc., Syracuse, N. Y. Capital $10,000. E. R. Lanterman and L. T. Allen, both of 117 Dewittshire Rd., Dewitt, N. Y., and L. G. Allen, 315 W. Calthrop Ave., Syracuse. Rubber and metal products.

Wearever Rubber Industries, Inc., 200 Finster St., Bridgeton, N. J. Capital 20,000 shares, no par value. D. V. Aitken, S. Detel, and M. Dalton, all of Bridgeton. Manufacture various kinds of rubber products.

Dividends Declared

Company	Stock	Rate	Payable	Stock of Record
Dominion Rubber Co., Ltd.	Pfd.	$1.75 q.	Mar. 31	Mar. 22
Firestone Tire & Rubber Co.	Com.	$0.10 q.	Apr. 20	Apr. 5
Fisk Rubber Corp.	6% Pfd.	$1.50 initial, q.	Apr. 2	Mar. 12
Garlock Packing Co.	Com.	$0.10 q.	Apr. 2	Mar. 15
Garlock Packing Co.	Com.	$0.15 extra	Apr. 2	Mar. 15
General Tire & Rubber Co.	Pfd.	$1.50 q.	Mar. 31	Mar. 20
Goodyear Tire & Rubber Co.	Pfd.	$1.75 q.	Apr. 2	Mar. 15
Goodyear Tire & Rubber Co. of Canada, Ltd.	Com.	$1.25 q.	Apr. 2	Mar. 15

NEW ENGLAND

Farrel-Birmingham Co., Inc., Ansonia, Conn., stockholders at their annual meeting February 15, reelected the following directors: Charles F. Bliss, Henry F. Wanning, Franklin Farrel, Jr., Nelson W. Pickering, Frederick M. Drew, Jr., David R. Bowen, Carl Hitchcock, Franklin R. Hoadley, Armin G. Kessler, Walter Perry, Julius G. Day, Fernley H. Banbury, William B. Marvin, Edward H. Green, William A. Gordon, Alton A. Cheney, and George C. Bryant. Then the directorate met and reelected the following officers: Mr. Farrel, chairman of the board; Mr. Pickering, president; Messrs. Bowen, Hitchcock, Hoadley, and Kessler, vice presidents; Mr. Drew, treasurer; Laurie K. Blackman, assistant treasurer; Mr. Bryant, secretary; and Mr. Marvin, assistant secretary.

Goodyear Sundries & Mechanical Co., Inc., with principal office at 95 Chambers St., New York, N. Y., and factory at Middletown, Conn., is the New York distributer for all the products of the Goodyear Rubber Co., including hose, belting, packing, molded goods, druggists' sundries, boots, clothing, sponge rubber, gaskets, tubing, matting, etc. F. V. Stroming is the company president; J. W. Kennedy, vice president; W. P. Culver, secretary-treasurer; and L. Lapidus, purchasing agent.

Fisk Rubber Corp.'s annual meeting at Chicopee Falls, Mass., on March 21, 1934, resulted in the reelection of 4 directors of the revolving board of 10 members. They are Orrin G. Wood, Edward D. Levy, John C. Traphagen, and Charles A. Dana.

United States Rubber Co., Valley St. plant, Providence, R. I., recently installed new machinery to manufacture latex rubber thread. Activities, consequently, have been stimulated; the production of this thread has been increased about 90%, and the number of employes in the department has risen by between 250 and 300. This thread, used as a core, is covered, by special machinery, with silk, rayon, cotton, or fibers of other material. The yarn, woven into a fabric gained great popularity since it was originated by this company 2 years ago in manufacturing women's foundation garments. The latest successful application is the construction of fabric for men's underwear. In the specialties division novelties are constantly produced. One of the most successful is men's rubber bathing suits. Recent improvements at this U. S. Rubber plant include extensive alterations to the first and second floors of No. 51 building, used for manufacturing and restaurant purposes, and the building of a reenforced concrete platform for an acid tank. The Woonsocket, R. I., Chamber of Commerce is trying to induce U. S. Rubber to reopen the Alice Mill there.

Covered Rubber Thread Manufacturer

The president, treasurer, and majority owner of the Lowell Covered Rubber Thread Co., Inc., 217 Jackson St., Lowell, Mass., is a man who has devoted his business career to one particular phase of a great industry, rubber thread. Albion J. Lefebvre started his climb up the ladder of success in 1904 when he became overseer of the elastic weaving department of the Vogt Coach Lace Co. and remained there until 1914. Then began his 13-year stay with Everlastik, Inc., chiefly as superintendent. The next 3 years were spent as superintendent of the jute weaving department of The Landers Corp., Toledo, O., and a similar period in a similar position in the corset webbing weaving department of the United Elastic Mill, Lowell. In 1933 Mr. Lefebvre founded his own company for making covered rubber thread.

He was born in St. Edward, Canada, on September 12, 1883. His formal education ended with his sophomore year in high school. So great has been his interest in his work that he has found little time or inclination for outside activities. Mr. Lefebvre resides at 270 Gibson St., Lowell, Mass.

The Apex Tire Co., Inc., Providence, R. I., has filed its schedules in bankruptcy showing assets of $29,642 and liabilities of $28,779. Among the largest creditors are Fisk Tire Co., Chicopee Falls, Mass., $6,687; Hoffman Tire Co., Lancaster, Pa., $1,600; Norwalk Tire & Rubber Co., Norwalk, Conn., $2,666, all secured, and Norwalk Tire, $1,780, and Polson Rubber Co., Garrettsville, O., $1,081, unsecured.

Bristol Mfg. Co., Bristol, R. I., has announced the appointment, as general superintendent, of Walter Joy, for 13 years with the Cambridge Rubber Co., Cambridge, Mass., and for several years past as assistant factory manager.

Carr Mfg. Co., Bristol, R. I., manufactures rubber thread and golf ball tape. A. H. Carr is president and treasurer.

Globe Rubber Works, Inc., 45 High St., Boston, Mass., dealer in packings, rubber covered rolls, molded goods, tubing, hose, belts, mats, and other rubber goods, is adding another floor to its quarters to accommodate its increased business. The firm also gives special attention to initial equipment, development, and research work.

Vultex Corp. of America, 666 Main St., Cambridge, Mass., has appointed Fred C. Batchellor in charge of sales for the New York metropolitan area and northern New Jersey.

Schavoir Rubber Co., manufacturer of rubber toys, balls, and specialties, moved its factory and offices from Stamford to Springdale, both in Conn.

NEW JERSEY

The upward trend in the automobile industry is keeping certain New Jersey rubber plants busy. A little improvement in hard rubber occurred, but no increase in the production of tires and tubes.

Joseph Stokes Rubber Co., Trenton, now occupies the new extension to its main plant. Stokes business is improving, and the Canadian plant is also busy.

Acme Rubber Mfg. Co., Trenton, reports a general improvement in business compared with this time last year. Some Acme departments are very busy.

William H. Sayen, president, Mercer Rubber Co., Hamilton Square, returned from a business trip through the Far West.

Murray Rubber Co., Trenton, finds business has declined, but looks for increased orders when spring arrives.

Essex Rubber Co., Trenton, continues busy in all departments.

Puritan Rubber Co., Trenton, notes improved business conditions with some new orders for spring delivery. President Frank Bernstein has been spending some time in Miami, Fla.

Hamilton Rubber Mfg. Co., Trenton, has placed a number of women at work in the cotton hose weaving department. The company is quite busy. Holland B. Slusser, vice president and treasurer, was elected to the Princeton Township Board of Education.

A. Lowenstein, 110 Lillie St., with a branch, Alligator Rubber Products Co., 218 Jeliff Ave., both in Newark, manufactures scrap rubber tire accessories.

The Pocono Co., Trenton, experiences good business, with prospects bright for the spring season.

Crescent Insulated Wire & Cable Co., Trenton, starting April 5 will receive the undivided attention of its president, Brigadier-General C. Edward Murray, for he tendered his resignation to Governor Moore, effective that date. Vice President C. Edward Murray, Jr., and Mrs. Murray have been cruising in the West Indies and South America.

The Thermoid Co., Trenton, reports that business continues good with all departments operating overtime. President R. J. Stokes has declared that the rights to the new options in connection with shares to be purchasable under the noteholders' plan expired March 17, and the notes presented for stamping under the plan, subsequent to that date, will not be entitled to receive any stock options.

The Kroydon Co., manufacturer of golf clubs and shafts, with factory at Burnett Ave., Maplewood, N. J., and branch at 14 E. Jackson Blvd., Chicago, Ill., vulcanizes rubber in molds on to the grip end of steel golf shafts. Company executives include C. L. Gairoard, president and treasurer; F. H. Ohaus, secretary; and J. C. Brisick, purchasing agent.

Editor's Book Table

NEW PUBLICATIONS

"R. S. L. Materials in Dry Heat Compounding." The Rubber Service Laboratories Co., Akron, O. This loose-leaf notebook comprises many practical formulae of mixings for use in the manufacture of rubber footwear, calender coated fabrics, etc. Also given are data comparing the effectiveness of R. S. L. accelerators with others.

"Organic Colors for Rubber." The Rubber Service Laboratories Co., Akron, O. This valuable booklet in loose-leaf form is replete with data on a large variety of organic colors differentiated for press, acid, and vapor cures. Formulae are given, and a selection of different colors in 2 concentrations are shown in samples of cured rubber. Some of the ordinary laboratory tests are included in tabular form.

"Standardized 'Bayer-Meister-Lucius' Stains. Stains for Microscopy, Bacteriology, and Other Scientific Purposes." Pfaltz & Bauer, Inc., 300 Pearl St., New York, N. Y. This is a partial list of Gruebler-Hollborn stains and microscopic preparations, usually carried in New York stock.

"Rubber Plate Printing." Process Rubber Plate Co., 610 W. Van Buren St., Chicago, Ill. This is a book of examples of printing in black and colors executed by the Gradie Oakes method of making rubber printing plates. The work illustrates the wide range of uses of rubber plates on sandpaper, cloth, cellusuede, parchment, book, and cover papers.

"What a Business Man Wants to Know about the Goodyear-Sears Contract." The Goodyear Tire & Rubber Co., Akron, O. This pamphlet in the form of pertinent questions and answers details the general and special relations of the Goodyear company with respect to the production of the special brands of Sears-Roebuck tires.

"The Goodyear Tire & Rubber Co. Annual Report to Stockholders, 1933." The Goodyear Tire & Rubber Co., Akron, O. This report summarizes a year of progress and successful operation. Among the pertinent points cited by President Paul W. Litchfield in his letter to stockholders is the fact that the company has no bank indebtedness and its ratio of current assets to current liabilities is 11.6 to 1. Following the section on the financial status of the company are many pages devoted to views of the domestic and foreign Goodyear tire plants and textile mills, illustrations of the company's rubber products, social and educational activities, and graphs and tabulated data on Goodyear tire production.

"Zinc Oxides for Every Purpose." American Zinc Sales Co., Columbus, O. Seven lead-free grades, 3 leaded grades, and several special grades of zinc oxides, all of the AZO brand, are described, and their analyses given. The adaptation of several of these grades for rubber uses is indicated and special recommendations cited for guidance of compounders. Two pages of photomicrographs compare the particle sizes of various AZO zinc oxides.

"Rubber Prices and Stocks." Hecht, Levis & Kahn, Ltd., 17 & 18 St. Dunstans Hill, London, E.C.3, England, issued this graphic chart showing the fluctuations of rubber prices and stocks by weeks and months for 1932 and 1933.

"The Ring Method for Surface Tension." Central Scientific Co., 460 E. Ohio St., Chicago, Ill. This is an extended treatise, known as Bulletin 101, on surface and interfacial tensions and their measurement by the ring method by means of the Cenco-du Nouy tensiometers. A bibliography of papers on the ring method is included.

"Hoists." Harnischfeger Corp., 4401 W. National Ave., Milwaukee, Wis. In this bulletin, No.-RH-1, modern hoist design of the P & H-Milwaukee Type "R" electric hoist is pictured in detail. The booklet treats of hoists for every plant purpose and their application to both general and specific problems. This bulletin lists the ratings and operating ranges for type "R" hoists together with specifications and electrical accessories.

"Bakelite Molded." Sixth Edition. Bakelite Corp., 247 Park Ave., New York, N. Y. This copiously illustrated booklet of 48 pages presents the very latest achievements in Bakelite molding materials. It is written interestingly and clarifies the importance of the molding art, describing what these materials are, their properties, uses, method of molding, and the equipment of molds, machinery, and presses employed.

"The Protection by Patents of Scientific Discoveries." Report of the Committee on Patents, Copyrights, and Trade Marks. By Joseph Rossman, chairman, F. G. Cottrell, A. W. Hull, and A. F. Woods Supplement to *Science*, No. 1, January, 1934, Volume 79. The Science Press, New York, N. Y. Price 50 cents. This report consists of 2 parts: Part I, Should Scientific Investigators Obtain Patents?; Part II, The Protection of Scientific Property. This very thorough study is interspersed with summaries and conclusions on the topics treated.

"Acrin Tire Stocks." Laboratory Report No. 171. E. I. du Pont de Nemours & Co., Inc., Rubber Chemicals Division, Wilmington, Del. This pamphlet announces the new accelerator Acrin. This new rubber chemical produces tire stocks that neither tend to soften nor become short and brittle when subjected to high temperatures and severe flexing in service. Tread, carcass, and cover compounds are given with cures and data on physical properties of each.

"Du Pont Rubber Dispersed Colors." Third Edition. E. I. du Pont de Nemours & Co., Inc., Rubber Chemicals Division, Wilmington, Del. This 3-leaf folder describes a color for every purpose in connection with rubber goods manufacture. These colors are colloidal dispersions in rubber produced by a patented process exclusive with du Pont which insures perfection and exact uniformity of shade. Two color charts of cured samples are contained showing reds, oranges, yellow, greens, blues, and purple in full and diluted tints. The basic formula is printed, and percentages of colors used are indicated. A table of properties of the colors is given, also notes on their use in hard rubber, open steam cure, and the effect of lime and accelerators.

"From One Engineer to Another." The Brown Instrument Co., Philadelphia, Pa. This broadside illustrates and briefly describes the Brown electric flow meter, which has interchangeable range tubes and automatic planimeter and operates on inductance bridge principle. It can be applied to any power plant to cut steam costs.

"Zsigmondy Ultrafiltration Apparatus and Membranes. Catalog No. U3, 1934." Pfaltz & Bauer, Inc., 300 Pearl St., New York, N. Y. The unusual interest expressed in the apparatus and supplies manufactured by the Membranfilter Co., Goettingen, Germany, has necessitated the publication of this, the most complete listing of this apparatus ever made in this country.

"The Job Ahead for Machinery." Farrel-Birmingham Co., Inc., Ansonia, Conn. This booklet has been distributed to about 2,000 executives of major business firms in the United States. It discusses the question of technological employment and from United States census facts and figures shows that there is no basis for the contention that the machine has permanently reduced the number of jobs available, but quite the reverse, and that it has contributed largely to social and economic progress and advanced the standard of living.

Rubber Industry in Europe

GREAT BRITAIN

Rubber Traffic Signs

In regulating motor traffic the advantage of road surface signs over vertical ones by the side of the road is that the former can be comprehended without distraction from the control of the vehicle or the road ahead. That surface signs have not yet made greater headway is due to the fact that most of them are ineffective because the ordinary block letters usually employed make no allowance for the distorted image presented by a sign when the sight angle is less than 14°, that is the angle formed at 20 feet from the driving seat of a car to the road surface.

In an article in *The India Rubber Journal* the new methods evolved for making road surface signs, in which rubber plays a prominent part, are discussed. With the viewpoint that a sign, to be distinct to an approaching driver, should look like an ordinary sign standing erect shadow projections of rigid, upright letters were first made, and the proportions thus obtained suitably corrected. The letters thus produced are long and narrow, and as they are too complicated to be drawn on the road surface from measurements, stencils must be used. Since each letter is about 6 feet long, metal stencils would be cumbersome and heavy to handle; however it was found that rubber stencils, cut from $\frac{1}{16}$-inch sheeting with a single insertion of cotton cloth, were most suitable.

British Industries Fair

This year again the rubber industry was well represented at the British Industries Fair in London. Among the new goods attracting attention were Cow & Co.'s "Li-Lo," a new air mattress for sports, sun bathing, etc., supplied in 7 colors; the company's new popular-priced oval hot-water bottle with extra-large mouthpiece; and brilliantly colored curtains. J. G. Franklin & Sons, specializing in bathing novelties, showed its new Franklin pneumatic Aerobotes, and inflatable latex tumbling toys, the Loch Ness Monster and Tumble-Dumpty; besides waterproof sponges and carry-alls with patent rubber slide fasteners. Imperial Chemical Industries displayed Seekay Wax, a non-inflammable wax for fireproofing electric cables and rubber floorings, among other things. Attractive bathing caps with the patent "Easy-Fit" lining of engraved lines on the inside were exhibited by the Reliance Rubber Co., Ltd. These lines, it seems, simplify putting on and removing the caps. Tiled rubber flooring, plain or marbled, in rolls 6 feet wide, were featured by the Runnymede Rubber Co. Raincoats in a variety of fabrics: corded velvet, marocain, rubberized artificial crepe-de-chine and cashmere were shown by various firms. Daniel Moseley & Sons, Ltd., attracted attention with a new solid rubber lamp base. This base, which, it seems, cannot be damaged by knocking over, is obtainable in a range of 10 plain and mottled colors. Shepherd Flexible Fabrics, Ltd., showed a flexible yarn said to consist of a strand of *rubberlike* yarn covered with silk, cotton, wool, etc. It can be combined with any fabric, is elastic, giving a 2-way stretch, and can also be used like ordinary sewing thread.

British Notes

In constructing the new high-speed target boats designed by H. Scott Paine for the Training Section of the Air Ministry, rubber plays an important part. The boats, intended to improve airplane bombing practice, are required for use at high speed in all weathers, must carry a heavy load of petrol and arms, and must be unsinkable. To the latter end Onazote expanded rubber was laid in vertical strips within the wooden framework of the boats. Although during trials bombs went clear through the Onazote parts of the hull, the boat remained buoyant, and it was found comparatively easy to replace the damaged strips after practice. Another special feature is rubber footings for the armor-plate housings to increase the efficiency of the armor.

A processed amorphous, diatomaceous, silica of great fineness and uniformity, known as Super Floss, is a new reenforcing pigment for rubber. It is snow white and has a specific gravity of 2.05 and an apparent density of 8/10 pound per cubic foot. It is produced by Wilfrid Smith, Ltd., 37 Great Tower St., London, E.C.3.

Kautex, a cork and rubber composition, is said to combine the qualities of cork with the strength of rubber. It will not spread when used for jointing or packing, absorbs vibration as well as tough sponge rubber without collapsing under compression, and has a much lower specific gravity than rubber. Supplied in plies from $\frac{1}{32}$- to ½-inch thick, it is obtainable from Kautex (Plastics) Ltd., Empire Works, 9 Deansbrook Rd., Edgeware, Middlesex.

The Rubber Powder Co., Ltd., newly registered with a nominal capital of £30,000, will acquire and exploit certain patents for producing rubber in granulated form from latex dispersions and solutions. The company will also make rubber sheet and sole crepe by a new process. The directors are Adam J. A. Yssel de Schepper and Age Meinisz, both of Holland, and Markham H. Thorp, a director of Motor House, Ltd., and other companies, and John A. Jameson.

In January, 1934, rubber footwear imports from British countries other than Canada were 19,226 dozen pairs against 160 dozen pairs in January, 1933. The sharp rise was commented upon in the House of Commons when it developed that the increase was largely due to shipments from Hongkong. This report brings up the question of what action Great Britain is to take to protect English manufacturers from the influx of goods produced by cheap Oriental labor in the British Possessions, a problem rendered delicate by the agreements made at the Ottawa Conference.

In connection with upholstery it is reported that numerous public authorities in England are now requisitioning sponge rubber mattresses for public institutions. It is stated that now 2,000 institutions are using one particular brand of sponge rubber mattress guaranteed to stand 10% carbolic acid, turpentine, urine, strong cold ammonia, and other corrosive and destructive elements likely to be encountered in hospitals.

GERMANY

Imports and Exports

Germany is apparently paying more attention to supplying home needs of rubber goods, for side by side with increased net imports of crude rubber amounting to 549,889 quintals in 1933 (and not including 32,281 quintals of reexported rubber) against 457,427 quintals the year before (not including reexports of 24,205 quintals), there is a reduction in imports of manufactured rubber goods from 21,827 quintals, value 8,427,000 marks, in 1932 to 18,555 quintals, value 5,526,000 marks, in 1933, and a similar decrease in exports of rubber goods from 149,759 quintals, value 57,021,000 marks, to 142,542 quintals, value 47,478,000 marks. The foreign footwear business was especially hard hit during the past year, for not only did imports fall to 66,215 pairs from 302,352 in 1932, but the exports also dropped from 1,117,603 to 727,693 pairs. Sharp declines are also noted

(*Continued on page* 58)

Rubber Industry in Far East

NETHERLANDS EAST INDIES

Harmful Salts in Rubber

The director of the Experiment Station West Java once again stresses the danger of the presence of manganese and copper salts in rubber and warns against the use of any chemical preparation, be it as coagulant or mold preventative, that contains either of these salts in any form. Even the use of a dilute solution of permanganate of potash to wash crepe or sheet to prevent mold is emphatically discouraged since manganese salts may get into the rubber in this way.

To show the harm that may be done, a letter is reproduced that was received from the management of a large rubber company on the East Coast of Sumatra. The American factories of this concern had an unusual experience with a lot of about 150 cases of smoked sheets from a Malayan estate. The rubber, about 2 years old, was so soft and tacky and deteriorated to such an extent that it was impossible to use it. Chemical analysis showed a high manganese content; in 2 samples this was respectively 1.07 and 1.19%. Now as the rubber, although having the appearance of smoked sheet, did not have the characteristic smell, it was assumed that the latex had been treated with some patented preparation containing permanganate of potash that gives sheet the appearance of smoked sheet without being smoked.

The letter in question points out that a serious condition would be created for manufacturers if the rubber offered were treated with chemicals containing manganese or copper, and the hope is expressed that no estates in the Netherlands Indies use such chemicals.

Restriction Troubles

Difficulties and obstacles in the way of restriction seem endless. Before the British in Malaya and Ceylon had even come to an understanding on native rubber with the Dutch the necessity of including Indo-China in a restriction scheme came to the fore. Now that negotiations include Indo-China far-seeing planners of restriction have suddenly become aware of the danger of omitting Siam and Sarawak, thus affording restriction evaders easily accessible smuggling bases. No sooner is one difficulty recognized than another bobs up.

Now suppose that at last all rubber producers in the Far East agree to abide by the provisions of the restriction scheme, would that situation mean all difficulties had been overcome and all troubles were over?

No, says a writer in the *Alg. Landbouwweekblad,* who points a warning finger at Belgian Congo. In 1901, its heyday, Belgian Congo produced 6,000 tons of wild rubber in one year. This has dwindled until at present the wild rubber exports are negligible. Plantation rubber, however, has to a certain extent taken the place of wild rubber although exports have never been large: 1932, 92 tons, against 242 tons in 1931. It seems in 1931 the area planted to Hevea, partly inferior Brazilian material and partly trees from Ceylon seed, totaled 6,26-i hectares of which 4,405 were mature. Since 1928 well-known Netherlands East Indies clones have been introduced, with satisfactory results.

In the *Bulletin Agricole,* an official Belgian publication, quoted by the author, A. Ringoet discusses in detail the possibilities for other rubber estates in Belgian Congo, for, an optimist, he believes that there is still a future for rubber planting in Belgian Congo and that it can profit from the experience gained elsewhere in Africa and in the Netherlands East Indies. He figures that an estate of 1,000 hectares planted with clones could be established and brought to the producing stage at a cost of 6,000,000 francs, and that the cost per pound of rubber would come to about 5¢. He also suggests that a native industry could be developed in which Europeans and natives cooperated, the former teaching the latter better methods, supplying tools, and buying the native product on a profit-sharing basis.

Rising Exports

Preliminary figures from the Dutch East Indies show that whereas exports during the first quarter of 1933 were only 52,219 tons, they were over 100,000 tons during the last quarter. At that rate these territories would have an annual output of 400,000 tons! As it is, the 1933 total is 322,544 tons, with record shipments of 37,216 tons for December alone. The increase, of course, is principally due to native rubber, for whereas the rise in exports from Java during the last quarter of 1933 as against the first came to 33%, the increase for the Outer Possessions was over 100%. Available figures for January, 1934, show a further increase in native rubber shipments, which came to 14,600 tons, topping the previous record of 13,430 tons in July, 1933. The total for the Outer Possessions was 27,465 tons against 12,668 tons in January, 1933, and for Java, 6,619 tons against 4,843 tons.

MALAYA

Rubber Roads

Many interesting facts regarding Malayan rubber roads and rubber goods factories were given by G. M. Kraay, of the West Java Experiment Station, after his return from a trip to Malaya and Sumatra. From this report it appears that the Cresson blocks laid in 1922 in Singapore by the Singapore Rubber Works continue to give good service although the surface shows some effect of 11½ years of exposure to tropical climate. Thus the top layer has hardened and shows a so-called alligator skin effect, but the rubber immediately below this is still elastic. Sections laid with rubber matting in Kuala Lumpur and Port Swettenham made a good impression; however the traffic in these places is light, and under heavy traffic conditions rubber mats have not stood up so well; the section in Paris (Quai de la Rappe) Mr. Kraay recalls, had to be renewed twice in 18 months.

In tests of a different nature a private company poured a mixture of about 20% latex and a variety of fillers and vulcanizing agents on to a road surface. A secret preparation, Parafix, was employed as adhesive. Sections were laid with this mixture in Singapore, Kuala Lumpur, and Penang, when it developed that the Parafix had a softening effect on asphalt, and covers laid over asphalt surfaces proved very unsatisfactory. Much better results were obtained when the foundation was concrete instead of asphalt.

The Rubber Research Institute has had laid small experimental sections surfaced with a mixture containing 25% of concentrated latex, cement, and other ingredients, and these are in excellent condition. But a larger experimental section on the road to Port Swettenham, laid with a somewhat modified mixture, proved so unsatisfactory that it soon had to be removed and replaced with asphalt. With these mixtures as with the preceding one, the surface obtained is not elastic, but hard.

The costs of laying a square meter of roadway by the above methods follow: The Cresson blocks, containing 50% rubber, cost about 57 guilders when laid, but today the work could probably be done for 22 guilders per square meter. The rubber mats came to 8.50 guilders per square meter; the latex mixtures ranged from 3.60 to 4.70 guilders per square meter. The last are cheapest, but as Mr. Kraay points out, asphalt-concrete roads cost about 1.80 guilders per square meter and last about 15 years. Incidentally they are 15 cm. thick against 1.25 to 2 cm. for

the latex mixture, so that although the Rubber Research Institute has made progress toward solving the problem of rubber roads, we are still a long way off.

Malayan Factories

Mr. Kraay next described the 2 Singapore rubber factories, the Singapore Rubber Works and Tan Kah Kee & Co., Ltd. The former works with Dutch capital, and the staff is mostly Dutch; while 120 of the total 420 Orientals employed are Javanese. This factory uses about 80 tons of rubber a month and produces various technical rubber articles. One of the specialties, the So-Easy wheel for baggage trucks, etc., is a disk of fairly hard, vulcanized rubber. These wheels are cheap and can be worn down very considerably before they have to be replaced. Another specialty, Cressonite tiles, consists of a layer of rubber backed with asbestos cement (Eternit) and is supplied in a number of colors. The walls and floors of certain large office buildings, palaces of sultans, and the new station at Singapore are covered with these tiles. Other products are rubber goods for railways, cycle inner tubes, colored ebonite articles, and rubber hose. The factory is well equipped and supplies Malaya's technical needs and also does a certain amount of exporting to neighboring countries, but nevertheless does not appear to be a very profitable enterprise.

Compared with the Singapore Rubber Works, the factory of Tan Kah Kee is immense, for it uses about 200 tons of rubber a month and employs approximately 5,000 persons. The chief products are shoes, of which 10,000 pairs are made daily, although the capacity is even greater; the shoes not only find a market locally, but are also exported to Europe. Other articles are cycle tires, of which the daily output is between 3,000 and 4,000; automobile tires, output, 80 per day; and technical rubber goods, besides various articles from latex, as gloves and balloons. Latex is also used by Tan Kah Kee to impregnate fabrics.

The Kuala Lumpur factory for Linatex products made by the Wilkinson process, and the process itself, are also described.

Concentrated Latex

While comparatively little interest has been shown in concentrated latex in Java, increasing quantities are being shipped from Sumatra and Malaya. Mr. Kraay discusses, besides the Dunlop process, Revertex. This, he says, is produced on 4 estates, 3 of which are in Johore, Malaya, and one in Sumatra, the total output being about 400 tons a month. Revertex is packed in drums holding about 104 liters and made on the estates from sheet iron. Creaming processes were used by various estates; gum tragacanth is employed as the creaming agent, and the product has a rubber content of 56%. One big American firm on the East Coast of Sumatra uses a special, patented creaming agent giving a 60% cream.

For shipping the latex in bulk are 4 storing tanks at Belawan, Sumatra, each with a capacity of 250 tons; while Port Swettenham also has 2 such tanks.

From his observations Mr. Kraay concludes that everything indicates a distinct future for shipping rubber in the form of latex.

Ceylon

Rubber producers in Ceylon have shown considerable interest in the possibilities of producing vulcanized products direct from latex on the plantations, and recently the Research Scheme received a number of inquiries concerning suitable methods of low-temperature vulcanization. Accordingly T. E. H. O'Brien, director of research at the Rubber Research Scheme (Ceylon), in a recent issue of the *Tropical Agriculturist* outlines a satisfactory method of compounding latex to yield a crepe curing slowly at temperatures of from 75° F. to 90° F., and resulting in 20 days in a product sufficiently vulcanized to be resistant to heat and sunlight and insoluble in rubber solvents.

According to the method, dilute latex is treated with a 5% solution of sodium bisulphite (1 part to 200 parts rubber), then stated proportions of zinc oxide, sulphur, accelerator (Z.D.C. or S.D.C.) and a color (Vulcafor) are thoroughly ground into a cream with a wetting agent (solution of Vulcastab A paste or Saponin). This mixture, slowly added to the latex, is thoroughly stirred, then coagulated with alum. This, it was found, was more suitable than formic acid. The resulting coagulum next is creped in the usual way and air dried, the drying taking 3 to 4 days, a shorter time than raw rubber requires. The crepe is made up into laminated sheets following the method for Ceylon sole crepe. The product thus obtained is similar in texture to this type of crepe, but, as stated above, sufficiently cured to resist heat and light; while it absorbs water less readily than crude rubber.

These sheets are suggested for table and bath mats, etc. The cost of the extra ingredients to be added to the latex is given as 9.84 rupees per 100 pounds of rubber. The writer adds that a few years ago a similar product was made in Malaya for shoe soles, but the increased cost of manufacture and the difficulty of disposing of the trimmings prevented its success.

GERMANY

(*Continued from page* 56)

in the tire business, but since the government is encouraging the use of automobiles, and production of motor vehicles is said to have increased markedly during 1933, the home tire requirements must have shown a corresponding development. Meanwhile imports of tires for automobiles numbered 14,921 in 1933 against 38,966; tubes, 9,589 against 16,060; cycle tires, 4,814 against 42,006; and cycle tubes, 13,382 against 325,387. Exports of automobile tires were 130,798 against 146,269; tubes, 99,104 against 105,155; cycle tires, 401,378 against 743,885; and tubes, 410,283 against 660,728.

Crude Rubber Analysis

Low grade crude rubber is bought in large quantities because it is cheaper, vulcanizes more rapidly, and is more easily and quickly milled than better grades, thus effecting a saving in power. However, as a factory manager in *Gummi-Zeitung* points out, these advantages are often more than offset by the bad effects on the quality of the finished product when the low grade rubbers have too high an ash or manganese content.

Tacky low grade rubber may contain up to 100 times as much manganese as good smoked sheets and first latex crepe. Regarding the ash content as an index to quality, the author gives figures based on hundreds of determinations which clearly show the relation between ash content and quality. The lowest figure, 0.06% is found for good, thin, first latex crepe; fine Sumatra crepe and thick, white, first latex crepe come next, 0.14 to 0.16%; while average first latex crepe shows 0.28%. For good, brown, estate crepe the range is from 0.35% for medium brown thin, to 1.36% for dark brown thin. It is to be noted that 2 samples of light brown, thin crepe have a higher ash content, 0.40% and 0.69% respectively, than 2 medium brown, thin crepes, 0.35 and 0.48% respectively. The highest figures are found for remilled rubber, the range being from 0.96% for light brown thin, uniform sheets to as much as 3.56% for dark, very tacky crepe. Incidentally, the light colored, thin, remilled, non-tacky sheets are practically equal to the medium brown thick and dark brown thin estate crepe, when the ash content is the criterion.

Accelerator 552

Accelerator 552 (Piperidine-pentamethylene-dithiocarbamate) is a super ultra-accelerator that produces speedy cures at all temperatures. Its fast action makes possible *continuous and self curing systems* for rubberized fabrics and sheet rubber. Mixing and processing can be handled safely by the split batch methods.

D.B.A.

D.B.A. is code designation for dibenzyl amine employed as activator of Z.B.X., code designation for zinc butyl xanthate. These materials, if compounded separately in complementary cement formulae, will, when the cements are mixed together, cause the combination cement to cure with great rapidity at low temperatures.

Patents and Trade Marks

MACHINERY

United States

1,944,389. **Tire Builder.** A. O. Abbott, Jr., Grosse Pointe Park, assignor to Morgan & Wright, Detroit, both in Mich.

1,944,465. **Tube Machine.** L. S. Rosener, assignor to Plant Rubber & Asbestos Works, San Francisco, Calif.

1,944,744. **Making Molds.** O. J. Kuhlke, assignor to National Rubber Machinery Co., both of Akron, O.

1,944,754. **Tube Splice Vulcanizer.** A. B. Mullin, assignor to Firestone Tire & Rubber Co., both of Akron, O.

1,944,767. **Tire Flexible Core Mounter.** H. D. Stevens, assignor to Firestone Tire & Rubber Co., both of Akron, O.

1,944,768. **Bead Builder.** W. C. Stevens, Uniontown, assignor to Firestone Tire & Rubber Co., Akron, both in O.

1,944,865. **Tire Building Form.** A. L. Heston, assignor to National Rubber Machinery Co., both of Akron, O.

1,944,882. **Sole Laying Machine.** S. J. Finn, Beverly, Mass., assignor to United Shoe Machinery Corp., Paterson, N. J.

1,945,098. **Resilient Tire Former.** H. Thorburn, Toronto, Ont., Canada.

1,945,336. **Centrifugal Separator Bowl.** G. J. Strezynski, Poughkeepsie, assignor to De Laval Separator Co., New York, both in N. Y.

1,945,640. **Foxing Treater.** L. E. James, Swampscott, Mass., assignor to United Shoe Machinery Corp., Paterson, N. J.

1,945,700. **Adhesive Paste Applier.** R. J. O'Brien, Rutherford, N. J., and E. Hazell, New York, N. Y., assignors to Naugatuck Chemical Co., Naugatuck, Conn.

1,945,883. **Tire Tread Splitter.** G. F. Connelly, San Francisco, Calif.

1,946,360. **Dipping Machine.** H. W. Roberts, Trenton, N. J.

1,946,449. **Collapsible Drum.** T. H. Williams, assignor to National Rubber Machinery Co., both of Akron, O.

1,946,802. **Winding Apparatus.** E. J. McIlvried, Akron, assignor to Vaughn Machinery Co., Cuyahoga Falls, both in O.

1,946,912. **Tire Tool.** M. M. Lory, Sioux City, Iowa.

1,946,924. **Calipering Mechanism.** A. Allen, Winchester, and J. G. Callan, Cambridge, assignors to Atlantic Precision Instrument Co., Boston, all in Mass.

1,947,080. **Elastic Filament Apparatus.** W. A. Gibbons, Montclair, N. J., E. Hazell, New York, N. Y., and A. W. Keen, Passaic, N. J., assignors to Revere Rubber Co., Providence, R. I.

1,947,090. **Rubber Filament Apparatus.** A. W. Keen, Passaic, N. J., assignor to Revere Rubber Co., Providence, R. I.

1,947,173. **Shoe Mold.** R. E. Riley, Akron, O., assignor to B. F. Goodrich Co., New York, N. Y.

1,947,202. **Extruding Machine Head.** O. F. Homeier, Akron, O., assignor to B. F. Goodrich Co., New York, N. Y.

1,947,258. **Tire Former.** V. B. Gay, Clinton, O., assignor to B. F. Goodrich Co., New York, N. Y.

1,947,270. **Tire Curing Bag Inserter.** C. W. Leguillon, Akron, and W. H. Slabaugh, Cuyahoga Falls, both in O., assignors to B. F. Goodrich Co., New York, N. Y.

1,947,335. **Vulcanizing Press.** B. De Mattia, Passaic, N. J.

Dominion of Canada

338,441 and 338,442. **Tire Casing Retreader.** P. E. Hawkinson, Minneapolis, Minn., U. S. A.

338,526. **Tire Bead Flipper.** General Tire & Rubber Co., assignee of H. A. Denmire, both of Akron, O., U. S. A.

338,698. **Rubber Treater.** Goodyear Tire & Rubber Co., assignee of R. B. Day, both of Akron, O., U. S. A.

338,752. **Tire Groover.** W. F. Errig, Philadelphia, and G. M. Pfundt, Churchville, both in Pa., U. S. A.

338,879. **Thread Chain-Looping Mechanism.** Optimit Gummi & Textilwerke A. G., assignee of A. Popper, both of Odrau, Czechoslovakia.

339,069. **Rubber Strip Former.** B. F. Goodrich Co., New York, N. Y., assignee of T. B. Farrington, Pasadena, Calif., both in the U. S. A.

339,221. **Centrifugal Bowl.** De Laval Separator Co., New York, N. Y., U. S. A., assignee of N. E. Bergner, Stockholm, Sweden.

339,231. **Vented Rubber Article Apparatus.** Goodyear Tire & Rubber Co., assignee of R. B. Day, both of Akron, O., U. S. A.

339,233. **Tire Tube Shaper.** Goodyear Tire & Rubber Co., assignee of G. E. Disney, both of Akron, O., U. S. A.

339,234. **Tire Mold.** Goodyear Tire & Rubber Co., assignee of J. C. Tuttle, both of Akron, O., U. S. A.

339,375 and 339,376. **Tire Builder.** General Tire & Rubber Co., assignee of W. J. Breth and M. L. Engler, co-inventors, all of Akron, O., U. S. A.

United Kingdom

399,573. **Wire Coiling Device.** Dunlop Rubber Co., Ltd., London, and H. Willshaw, Birmingham.

399,614. **Material Physical Quality Tester.** Avon India Rubber Co., Ltd., and W. Cliffe, Melksham.

399,688. **Bead Core Builder.** A. H. Stevens, London. (National-Standard Co., Niles, Mich., U. S. A.)

400,548. **Rubber Coated Fiber Carder.** International Latex Processes, Ltd., St. Peter's Port, Channel Islands, assignee of Magyar Ruggyantaarugyar Reszvenytarsasag, Budapest, Hungary.

400,794. **Rubber Warp Chainer.** Optimit Gummi & Textilwerke A. G., Odrau, Czechoslovakia.

400,809. **Centrifugal Separator.** A. Nyrop, Hellerup, Denmark.

Germany

592,232. **Comb Cutter.** C. Tober, Berlin-Karlshorst.

593,151. **Rubber Strip Cutter.** Dunlop Rubber Co., Ltd., London, England. Represented by B. Kaiser, Frankfurt a.M.

593,424. **Conveyer Vulcanizer.** Franz Clouth Rheinische Gummiwarenfabrik A.G., Koln-Nippes.

593,600. **Tire Inflater and Compressed Air Supplier.** K. Arnoldt, Berlin-Charlottenburg.

593,639. **Electrically Heated Vulcanizing Mold.** Siemens-Schuckertwerke A.G., Berlin-Siemensstadt.

593,874. **Packings Mold.** Westinghouse-Bremsen-Gesellschaft m.b.H., Hannover.

PROCESS

United States

1,944,533. **Artificial Board.** C. J. Strobel, Port Huron, assignor to St. Clair Rubber Co., Detroit, both in Mich.

1,945,055. **Rubber Article.** E. W. Madge, assignor to Dunlop Rubber Co., Ltd., both of Birmingham, England.

1,945,173. **Artificial Leather.** F. O. Woodruff, Newton, assignor, by mesne assignments, to Beckwith Mfg. Co., Boston, both in Mass.

1,945,256. **Deposition of Rubber.** R. B. F. F. Clarke, Bramhall, assignor to Imperial Chemical Industries, Ltd., Westminster, both in England.

1,946,090. **Coating Fabrics.** J. McGavack, Jackson Heights, N. Y., assignor to Naugatuck Chemical Co., Naugatuck, Conn.

1,946,932. **Laminated Product.** R. P. Courtney, Maplewood, N. J., assignor to Bakelite Corp., New York, N. Y.

Dominion of Canada

338,443. **Caulking Material.** E. V. Hayes-Gratze, London, England.

338,468. **Hosiery Welting.** P. Schöenfeld, Chemnitz, Germany.

338,529. **Rubber Surface Processing.** International Latex Processes, Ltd., St. Peter's Port, Channel Islands, assignee of Dominion Rubber Co., Ltd., Montreal, P. Q., assignee of P. H. Watkins, Naugatuck, Conn., U. S. A.

338,696. **Pneumatic Tire Building.** Goodyear Tire & Rubber Co., assignee of G. D. Mallory, both of Akron, O., U. S. A.

338,950. **Stamp Affixing Method.** DuPont Cellophane Co., Inc., assignee of E. B. Benger, both of Wilmington, Del., U. S. A.

339,009. **Rubberized Fabric.** Anode Rubber Co., Ltd., St. Peter's Port, Channel Islands, assignee of F. Gabor and L. Havas, co-inventors, both of Budapest, Hungary.

339,043. **Abrasive Article.** Carborundum Co., Niagara Falls, assignee of O. LeB. Mahlman, Kenmore, and R. C. Benner, Niagara Falls, co-inventors, all in N. Y., U. S. A.

339,077. **Rubber Containing Article.** International Latex Processes, Ltd., St. Peter's Port, Channel Islands, assignee of E. A. Murphy and R. G. James, co-inventors, both of Birmingham, England.
339,232. **Reducing Tire Noise.** Goodyear Tire & Rubber Co., assignee of R. D. Evans, both of Akron, O., U. S. A.
339,313. **Expanded Rubber Material.** G. P. Denton, Rickmansworth, England.
339,365. **Suction Roll.** Dominion Engineering Works, Ltd., Lachine, assignee of H. G. Welsford, Montreal, both in P. Q.

United Kingdom

400,147. **Rubber Strips.** International Latex Processes, Ltd., St. Peter's Port, Channel Islands, assignee of J. R. Gammeter, Akron, O., U. S. A.
400,177. **Floor Covering.** Linoleum Mfg. Co., Ltd., and A. A. Godfrey, both of London.
400,815. **Bathing Cap.** O. Moser, Vienna, Austria.
400,846. **Rubber Thread.** International Latex Processes, Ltd., St. Peter's Port, Channel Islands, assignee of Magyar Ruggyantaarugyar Reszvenytarsasag, Budapest, Hungary.
400,874. **Goods from Rubber Dispersions.** R. F. McKay, Birmingham. (International Latex Processes, Ltd., St. Peter's Port, Channel Islands.)
400,893. **Vulcanizing Tires.** Soc. Italiana Pirelli, Milan, Italy.
400,969. **Coagulating Latex.** F. Homberger, Sumatra, Dutch East Indies.

Germany

593,464. **Cogged V-Belts.** A. L. Freedlander, Dayton, O., U. S. A. Represented by P. Dominik, Offenbach a.M.
593,877. **Felt or Fabric Coverings.** Continental Gummi-Werke A.G., Hannover.

CHEMICAL

United States

1,944,346. **Accelerator.** W. Huhn, Cologne-Mulheim a. Rhine, assignor to I. G. Farbenindustrie A. G., Frankfurt a. M., both in Germany.
1,944,843. **Accelerator.** H. A. Morton, Akron, O.
1,945,576, 1,945,577, and 1,945,578. **Accelerator.** W. P. TER Horst, Akron, O., assignor to Naugatuck Chemical Co., Naugatuck, Conn.
1,945,803. **Latex Cement.** M. E. Delaney, Bloomfield, N. J., assignor to Halowax Corp., New York, N. Y.
1,946,002. **Age Resister.** R. L. Sibley, Nitro, W. Va., assignor to Rubber Service Laboratories, Co., Akron, O.
1,946,003. **Latex Treatment.** R. L. Sibley, Nitro, W. Va., assignor to Rubber Service Laboratories Co., Akron, O.
1,946,333. **Rubber Compound.** B. Rewald, assignor to Hanseatische Muhlenwerke Aktiengesellschaft, both of Hamburg, Germany.
1,946,704. **Accelerator.** G. L. Magoun, Nitro, W. Va., assignor to Rubber Service Laboratories Co., Akron, O.
1,946,960. **Accelerator.** O. Behrend, Woodhaven, N. Y., assignor to Rubber Service Laboratories Co., Akron, O.

Dominion of Canada

338,697. **Accelerator.** Goodyear Tire & Rubber Co., assignee of A. M. Clifford, both of Akron, O., U. S. A.
338,759. **Age Resister.** I. Williams, Woodstown, N. J., and A. M. Neal, Wilmington, Del., co-inventors, both in the U. S. A.
338,946. **Rubber Conversion Product.** W. Becker, Koln-Mulheim, L. Orthner, Leverkusen-I. G. Werk, and A. Blömer, Inbach near Opladen, co-inventors, all in Germany.
339,068. **Age Resister.** B. F. Goodrich Co., New York, N. Y., assignee of D. Craig, Akron, O., both in the U. S. A.
339,070. **Coating Composition.** Goodyear Tire & Rubber Co., assignee of H. A. Endres, both of Akron, O., U. S. A.
339,235. **Antioxidant.** Goodyear Tire & Rubber Co., Akron, assignee of H. I. Kramer, Cuyahoga Falls, both in O., U. S. A.
339,366. **Rubber Composition.** Dunlop Rubber Co., Ltd., London, assignee of D. F. Twiss and F. A. Jones, co-inventors, both of Birmingham, all in England.
339,377. **Rubber-Like Composition.** B. F. Goodrich Co., New York, N. Y., assignee of W. L. Semon, Silver Lake, O., both in the U. S. A.

United Kingdom

400,001. **Rubber Composition.** E. Frölich, Osterode-on-Harz, Germany.
400,024. **Coloring Rubber.** I. G. Farbenindustrie A. G., Frankfurt a. M., Germany.
400,158. **Rubber Composition.** J. R. Geigy A. G., Basle, Switzerland, assignee of C. Martini, Munich, Germany.
400,225. **Aqueous Dispersion Coating.** A. J. Stephens, London. (Collins & Aikman Corp., Philadelphia, Pa., U. S. A.)
400,829. **Latex Rubber Paint.** A. G. Rodwell, London.
400,898. **Chlorinating Rubber.** Chemische Fabrik Buckau, Saalkreis, Germany.
400,990 and 400,991. **Accelerator.** Rubber Service Laboratories Co., Akron, O., U. S. A.
401,038. **Vulcanizing Material.** Metallges A. G., Franfurt a. M., and O. Schober and A. Schnitzspahn, both of Horrem, all in Germany.
401,149. **Fibrous Composition.** J. Klasi, St. Gall, Switzerland.
401,295. **Solid Lubricating Grease.** J. Y. Johnson, London. (I. G. Farbenindustrie A. G., Frankfurt a. M., Germany.)
401,353. **Age Resister.** Naugatuck Chemical Co., assignee of L. Meuser and P. J. Leaper, all of Naugatuck, Conn., U. S. A.
401,534. **Coating Composition.** Hercules Powder Co., Wilmington, assignee of F. K. Shankweiler, Newport, both in Del., U. S. A.
401,653. **Paint.** F. B. Dehn, London. (Rohm & Haas A. G., Darmstadt, Germany.)

GENERAL

United States

1,944,232. **Sash Construction.** W. S. Hamm. Elkhart, Ind., assignor to Adlake Co., Chicago, Ill.
1,944,233. **Vibration Damper.** W. E. Hann, assignor to Chrysler Corp., both of Detroit, Mich.
1,944,248. **Motor Mounting.** R. K. Lee and C. L. Humphrey, both of Highland Park, assignors to Chrysler Corp., Detroit, all in Mich.
1,944,255. **Ring Holding Arbor.** T. E. McFall and C. H. Warren, both of Sparta, Mich.
1,944,355. **Closure.** D. R. MacKenzie, Ardsley, N. Y.
1,944,377. **Amusement Device.** D. E. Taylor, Willimantic, Conn.
1,944,426. **Wire Cable Sheave.** H. B. Greening, assignor to Galloway Engineering Co., Ltd., both of Hamilton, Ont., Canada.
1,944,433. **Safety Clothes Wringer.** W. L. Kauffman, 2d, Youngstown, O.
1,944,466. **Pneumatic Mattress.** B. C. Rubin, New York, N. Y.
1,944,553. **Douche.** E. M. Freund, Albany, N. Y.
1,944,591. **Hosiery.** W. P. Brown, New Haven, Conn.
1,944,634. **Cable.** C. P. Brodhun, Wilkes-Barre, Pa.
1,944,834. **Adhesive Tape.** F. I. Bennett, Jr., Highland Park, assignor to Johnson & Johnson, New Brunswick, both in N. J.
1,944,951. **Tire Valve Tube Cap.** J. E. Ross, Kansas City, Mo.
1,945,062. **Golf Ball.** T. W. Miller, Ashland, assignor to Worthington Ball Co., Elyria, both in O.
1,945,093. **Girdle.** M. S. Strait, Tulsa, Okla.
1,945,134. **Elastic Exerciser.** J. H. Brunk, Los Angeles, Calif.
1,945,138. **Link Belt.** J. K. Diamond, assignor to Clipper Belt Lacer Co., both of Grand Rapids, Mich.
1,945,181. **Diaphragm Pump.** W. C. Carter, Flint, Mich.
1,945,208. **Pipe Cleaner.** E. F. Troy, Jacksonville, Fla.
1,945,226. **Polo Boot.** C. F. Lutsche, Schofield Barracks, Hawaii.
1,945,293. **Pipe Joint.** R. H. Pierce, Eugene, Ore.
1,945,369. **Pivotal Connection.** H. C. Harris, Akron, O.; A. H. Harris, administrator of said H. C. Harris, deceased, assignor, by mesne assignments, to First-Central Trust Co., as trustee, both of Akron, O.
1,945,386. **Teat Cup.** J. J. Stampen, assignor to Babson Mfg. Corp., both of Chicago, Ill.
1,945,420. **Heel Guard.** G. L. Charles, Bryan, O.
1,945,440. **Exercising Ball Support.** W. P. Maslo, Reading, Pa.
1,945,538. **Artificial Fabric.** G. L. Schwartz, assignor to E. I. du Pont de Nemours & Co., both of Wilmington, Del.
1,945,559. **Toothbrush.** E. M. McNally, assignor to Tefra Co., both of Indianapolis, Ind.
1,945,595. **Shackle.** R. H. Chilton, assignor to Inland Mfg. Co., both of Dayton, O.
1,945,605. **Freezing Tray.** H. D. Geyer, assignor to Inland Mfg. Co., both of Dayton, O.
1,945,762. **Sole-Affixing Machine.** A. J. Weiss, W. Orange, N. J., assignor to Compo Shoe Machinery Corp., New York, N. Y.
1,945,764. **Submarine Cable.** G. Zapf, Cologne, assignor to Felten & Guilleaume Carlswerk A. G., Cologne-Mulheim, both in Germany.
1,945,765. **Machine Rest.** H. Alpern,

assignor of ½ to L. B. Cook, both of Pittsburgh, Pa.

1,945,919. **Life Saving Mask.** M. F. Seijo, Newark, N. J.

1,946,009. **Windshield Cleaner.** J. Besson, Stockton, Md.

1,946,017. **Window Pane Seal.** H. C. Ennis, Flin Flon, Man., Canada.

1,946,106. **Connecter.** R. Patrick, assignor to United States Tire Co., Inc., both of Indianapolis, Ind.

1,946,190. **Cable.** C. P. Brodhun, Wilkes-Barre, Pa.

1,946,209. **Traction Tread.** W. E. Hardeman, Birmingham, and E. S. Tompkins, Stratford-on-Avon, both in England, assignors to Dunlop Tire & Rubber Corp., Buffalo, N. Y.

1,946,220. **Cooker.** F. Lotz, New York, N. Y.

1,946,224. **Tire Gage.** L. Mastrangel, Union City, N. J.

1,946,337. **Signaling Cable.** W. S. Smith, Newton Poppleford, H. J. Garnett, Sevenoaks, and J. N. Dean, Orpington, all in England.

1,946,367. **Tire Tread.** H. R. Straight, Adel, Iowa.

1,946,378. **Golf Ball.** L. A. Young, Detroit, Mich.

1,946,400. **Teat Cup Cleaner.** C. H. Hapgood, Nutley, N. J., assignor to De Laval Separator Co., New York, N. Y.

1,946,622. **Tire.** J. J. Hruska, Milwaukee, Wis.

1,946,636. **Horseshoe.** E. Nygaard, Oslo, Norway.

1,946,661. **Flexible Driving Mechanism.** F. W. Baker, Stourbridge, England, assignor to Trinity Wheel Corp., New York, N. Y.

1,946,806. **Tire Valve Cap.** G. A. Morris, St. Louis, Mo.

1,946,948. **Vehicle Spring Suspension.** D. G. Roos, assignor to Studebaker Corp., both of South Bend, Ind.

1,946,954. **Door Stop and Cushion.** J. L. Ventura, Park Ridge, Ill.

1,946,981. **Bottle Stopper.** M. S. Lower, Barberton, O., assignor to Sun Rubber Co., a corporation of O.

1,947,005. **Bathing Garment and Life Preserver.** K. Gunther, Detroit, Mich.

1,947,132. **Mounting.** T. Lord, assignor to H. C. Lord, both of Erie, Pa.

1,947,144 and 1,947,145. **Tire Cover.** O. U. Zerk, Cleveland, O.

1,947,152. **Carpet Material.** F. W. Clark, assignor to Sanford Mills, both of Sanford, Me.

1,947,164. **Phonograph Reproducer.** L. A. Morrison, Brooklyn, assignor to Bell Telephone Laboratories, Inc., New York, both in N. Y.

1,947,183. **Footwear Upper.** V. H. Bodle, Newton, assignor to Hood Rubber Co., Inc., Watertown, Mass.

1,947,185. **Windshield Wiper Blade.** F. Browett, Cleveland, O.

1,947,257. **Valve Structure.** H. E. Fritz, Barberton, and J. R. Hoover, Cuyahoga Falls, both in O., assignors to B. F. Goodrich Co., New York, N. Y.

1,947,283. **Doll's Eye Set.** J. H. Wilhelm, Hamilton Beach, assignor to Margon Corp., New York, both in N. Y.

1,947,293. **Eye Set and Doll's Head.** L. J. Grubman, Belle Harbor, assignor to Margon Corp., New York, both in N. Y.

1,947,294. **Doll's Movable Eye Set.** L. J. Grubman, Belle Harbor, assignor to Margon Corp., New York, both in N. Y.

1,947,296. **Doll's Rolling Eye Set.** A. Konoff, assignor, by mesne assignments, to Margon Corp., both of New York, N. Y.

1,947,307. **Wire Cloth Supporter.** H. R. Rafton, Andover, Mass., assignor to Rafton Engineering Corp., a corporation of Mass.

1,947,314. **Signaling Cable.** W. S. Smith, Newton Poppleford, H. J. Garnett, Sevenoaks, and J. N. Dean, Orpington, all in England.

1,947,353. **Atomizer.** R. Mueller, Yonkers, N. Y.

Dominion of Canada

338,457. **Electric Cable.** F. Meiwald, Schloss Schönbrunn, Austria.

338,469. **Jar Cap.** A. L. Schram, Hillsboro, Ill., U. S. A.

338,527. **Heel.** Holtite Mfg. Co., assignee of A. A. Esterson, both of Baltimore, Md., U. S. A.

338,596. **Lamp Socket.** J. G. Smith and R. F. Berner, co-inventors, both of Guelph, Ont.

338,603. **Mechanical Vacuum.** E. E. Cannon, Beaumont, Tex., U. S. A.

338,614. **Air Valve Cap.** W. H. Grainger, Toronto, Ont.

338,621. **Gun Stock Pad.** W. W. Knight, Cicero, Ill., U. S. A.

338,626. **Biplane Parachute.** F. Loske, New York, N. Y., U. S. A.

338,643. **Pipe Cleaner.** R. Smith, Puerto Castilla, Hondurás.

338,683. **Valve Cap.** Dill Mfg. Co., Cleveland, assignee of J. C. Crowley, Cleveland Heights, both in O., U. S. A.

338,684. **Valve Insides.** Dill Mfg. Co., Cleveland, assignee of J. C. Crowley, Cleveland Heights, both in O., U. S. A.

338,695. **Inner Tube.** Goodyear Tire & Rubber Co., assignee of W. Stephens, both of Akron, O., U. S. A.

338,700. **Ball.** Googly, Ltd., assignee of E. J. Dobbins, London, England.

338,749. **Hair Wave Cap.** R. C. Kaplan, co-inventor with and assignee of M. C. Elperin, both of New York, N. Y., U. S. A.

338,763. **Massager.** S. F. Bowser, Fort Wayne, Ind., U. S. A.

338,783. **Float Valve.** J. F. Goodwin, Sarnia, Ont.

338,792. **Cushion Device.** E. B. Killen, London, England.

338,810. **Double Ampulla.** M. Novak, Durlach, Germany.

338,819. **Nurser Nipple.** P. L. G. Sylvain, Montreal, P. Q.

338,951. **Sound Board.** F. M. Best, New York, N. Y., U. S. A.

339,010. **Bellows.** S. F. Arbuckle Corp., Detroit, assignee of S. F. Arbuckle, Highland Park, both in Mich., U. S. A.

339,011. **Bellows.** S. F. Arbuckle Corp., assignee of C. J. Whitacre, both of Detroit, Mich., U. S. A.

339,078. **Suction Nozzle.** Inventia Patent - Verwertungs - Gesellschaft, Schaffhausen, Switzerland, assignee of A. Eriksson-Jons, Stockholm, Sweden.

339,176. **Skate.** C. C. Skinner, Gananoque, Ont.

339,183. **Raincoat.** F. R. Tripp, Bristol, England.

339,191. **Electric Device Handle and Housing.** Albertson & Co., Inc., assignee of F. O. Albertson, both of Sioux City, Iowa, U. S. A.

339,202. **Paper Machine.** Beloit Iron Works, assignee of E. E. Berry and T. C. Roberts, co-inventors, all of Beloit, Wis., U. S. A.

339,236. **Tire and Fabric.** Goodyear Tire & Rubber Co., assignee of R. P. Dinsmore, both of Akron, O., U. S. A.

United Kingdom

398,224. **Rail Vehicle Suspension.** S. E. Alley, London.

398,343. **Rail Vehicle Running Gear.** Austro Daimler-Puchwerke A. G., Vienna, Austria.

399,047. **Rail Vehicle Undercarriage.** J. Bugatti, Molsheim, Bas-Rhin, France.

399,120. **Endless Belt Conveyer.** A. Anderson and Anderson, Boyes & Co., Ltd., both of Motherwell, Scotland.

399,194. **Engine Mounting.** T. H. Royce, Derby.

399,325. **Tire.** E. Coenning, Cassel, Germany.

399,335. **Road and Rail Wheel.** Soc. Pour L'Exploitation De Brevets De Roues Automobiles (Sebra), Paris, France.

399,345. **Water Tap.** M. Lorquet and R. Ernalsteen, both of Brussels, Belgium.

399,407. **Pad.** W. R. Bloomer and P. L. Liddell, both of London.

399,466. **Steering Gear.** Budd Wheel Co., Philadelphia, Pa., assignee of R. H. Rosenberg, Detroit, Mich., both in the U. S. A.

399,548. **Aerial.** Marconi International Marine Communication Co., Ltd., O. D. Kennedy, and R. H. Mead, all of London.

399,568. **Calendar.** S. C. Harper, London.

399,607. **Air-Screw.** W. R. Turnbull, Rothesay, N. B., Canada.

399,649. **Surfacing Pulley.** D. G. D. Sloan, Williams, Western Australia.

399,650. **Pressure Relieving Valve.** J. Laing, Welwyn Garden City.

399,760. **Water Skis.** E. Sessler, Elster, Germany.

399,765. **Bathing Appliance.** Brevetto Soc. Anon., Lugano, Switzerland.

399,773. **Percussive Drill.** F. Hills, Ilford.

399,857. **Driving Belt.** O. L. Whittle, Warrington.

399,877. **Electric Switch.** Vickers-Armstrongs, Ltd., and H. B. Pratt, both of Westminster.

399,882. **Battery.** F. Temple, Alford.

399,886. **Helicopter.** J. R. Porter, Twyford, and A. L. Fullalove, Wantage.

399,918. **Liquid Elevating Apparatus.** W. H. Exley, Market Harborough, and W. Haddon, London.

399,963. **Wheel.** India Rubber, Gutta Percha & Telegraph Works Co., Ltd., and F. G. Tarris, both of London.

399,976. **Laminated Spring Shackle.** Tecalemit, Ltd., Brentford.

400,044. **Footwear.** A. Arfeuillere, Meulan, France.

400,047. **Ball.** F. Suttle, Cambridge.

400,048. **Vehicle Body.** J. Ganz, Frankfurt a. M., Germany.

400,052. **Compound Sheet Material.** Kirkbach'sche Werke Kirchbach & Co., Dresden, Germany.

400,064. **Dental Syringe.** W. I. Carpenter, Norfolk, Va., U. S. A.

400,075. **Hat Holder Coin-Controlled Device.** L. S. Van Westrum, The Hague, Holland.

400,078. **Body Washer.** W. R. Bloomer and P. L. Liddell, both of London.

400,116. **Engine Mounting.** Siemens & Halske A. G., Berlin, Germany.

400,156. **Catamenial Appliance.** Tek-

shon Corp., New York, N. Y., U. S. A.

400,247. **Electrolytic Cell.** D. J. Evans, Tonbridge.

400,255. **Hermetically Sealed Tin.** W. J. Richardson & Sons., Ltd., and D. S. Richardson, both of London.

400,277. **Inductance Coil.** Marconi's Wireless Telegraph Co., Ltd., London, and F. E. Robinson, Colchester.

400,327. **Golf Ball.** P. A. Martin, Birmingham.

400,341. **Road Vehicle Suspension.** P. Dupuy, Paris, and J. Mercier, Neuilly-sur-Seine, both in France.

400,347. **Paper Sorter.** C. C. Casey, Detroit, Mich., U. S. A.

400,372. **Corset.** P. J. Moran, Newark, N. J., U. S. A.

400,436. **Skate.** A. User, Paris, France.

400,440. **Microphone.** Marconi's Wireless Telegraph Co., Ltd., London. (E. C. Guedon, Camden, N. J. U. S. A.)

400,460. **Tire Valve.** Goodyear Tire & Rubber Co., Akron, O., U. S. A.

400,476. **Flashlight Lamp.** M. Igari, Tokio, Japan.

400,481. **Shirt.** J. C. Chippendale and Middlebrook Mfg. Co., Ltd., both of Manchester.

400,490. **Electrolytic Condenser.** Naamlooze Vennootschap Philips' Gloeilampenfabrieken, Eindhoven, Holland.

400,502. **Latex Impregnated Felt.** E. Von Asten, Hauset, Belgium.

400,589. **Film.** H. Dreyfus, London.

400,595. **Bottle Display.** C. Bunn, Ltd., West Bromwich, and A. R. Heath, London.

400,597. **Foil.** H. Dreyfus, London.

400,601. **Burglar Alarm.** C. Stengel, Budapest, Hungary.

400,617 and 400,664. **Granular Material Feeder.** J. B. Corrie & Co., Ltd., London. (A. Baillot & Cie., Paris, France.)

400,665. **Tire Valve.** R. E. Hillier, Akron, O., U. S. A.

400,684. **Metal Bending Machine.** H. J. Taplin, Wembley.

400,695. **Fluid-Actuated Valve.** H. E. Rudge & Co., Ltd., and H. E. Rudge, both of Birmingham.

400,706. **Pantographic Apparatus.** C. M. Linley and J. Day, both of London.

400,753. **Reservoir Brush.** G. T. Wragg, Huddersfield.

400,777. **Electric Hot Water Bottle.** R. Eder, Vienna, Austria.

400,778. **Road Surface Marking Block.** J. Aitken, London.

400,781. **Cable.** Kabelwerk Vacha A. G., Vacha, Germany.

400,788. **Hair Waver.** United States Appliance Corp., assignee of R. M. Keele, both of San Francisco, Calif., U. S. A.

400,814. **Offset Blanket.** J. E. Pollak, London. (Multigraph Co., Cleveland, O., U. S. A.)

400,816. **Envelope Canceller.** Soc. De L'Outillage R. B. V., Paris, France.

400,820. **Non-Skid Stud.** E. Whitaker and W. Veitch, both of Bedford.

400,831. **Reservoir Brush.** R. Jecker, Basle, Switzerland.

400,841. **Vehicle Suspension System.** E. Bugatti, Molsheim, Bas-Rhin, France.

400,856. **Elastic Stocking.** J. R. Kendrick Co., Inc., Philadelphia, Pa., U. S. A.

400,860. **Sock Suspender.** E. H. Frisell, Stockholm, Sweden.

400,889. **Shaving Brush.** D. H. Low, Glasgow, Scotland.

400,931. **Printing Machine Feeder.** R. W. Crabtree & Sons, Ltd., and A. B. Evans, both of Leeds, and H. M. Taylor, Scholes.

400,950. **Fabric Stretcher.** J. H. Wrigley, Worthington, A. Melville, Standish, and A. B. Henshilwood, Thornbury.

401,029. **Paving Block.** J. Duffy, Barking.

401,051. **Sifter.** W. E. Cotton & Sons (Brass founders), Ltd., and W. E. Cotton, both of Stoke-on-Trent.

401,119. **Railway Vehicle.** E. Rimailho, Paris, France.

401,143. **Railway Vehicle Undercarriage.** E. Bugatti, Molsheim, Bas-Rhin, France.

401,195. **Vacuum Cleaner.** Electrolux, Ltd., London, assignee of Inventia Patent - Verwertungs - Ges., Schaffhausen, Switzerland.

401,198. **Boot.** E. Schneider, Bad Kreuznach, Germany.

401,204. **Perfumery Outfit.** E. Arden, Ltd., London, assignee of E. Arden Ges., Berlin, Germany.

401,272. **Amber.** J. Habesch, Harrogate.

401,299. **Laminated Glass.** British Celanese, Ltd., and W. H. Moss, both of London.

401,359. **Battery Case Holder.** J. Lucas, Ltd., and O. Lucas, both of Birmingham.

401,414. **Impression Blanket.** F. Reddaway and W. C. Gardiner, both of Manchester.

Germany

592,231. **Anti-Skid Device.** E. Dietze, Berlin-Grunemwald.

592,648. **Inflation Valve.** Radium-Gummiwerke m.b.H., Koln-Dellbruck.

593,350. **Tire.** Compagnie Française du Caoutchouc, Neuilly, Seine, France. Represented by R. Meldau, Berlin-Charlottenburg.

593,578. **Protective Covering on Metal.** Dunlop Rubber Co., Ltd., London, England. Represented by B. Kaiser, Frankfurt a. M.

TRADE MARKS

United States

309,003. Outline of the map of the United States, and the word: **"All-state."** Crib sheets, etc. Sears, Roebuck & Co., Chicago, Ill.

309,049. **Lassie.** Elastic webbing. Southern Webbing Mills, Inc., Greensboro, N. C.

309,054. **Steel Spun.** Hose. Armored Tube Co., Malden, Mass.

309,055. **Red Driver.** Traction belts. Sears, Roebuck & Co., Chicago, Ill.

309,080. **"Holey-Poley."** Game. W. S. Luckett, New York, N. Y.

309,103. **Snoozie.** Dolls. Ideal Novelty & Toy Co., Brooklyn, N. Y.

309,118. **Sta-Put.** Typewriter erasers. L. J. Hart, doing business as Sta-Put Eraser Co., New York, N. Y.

309,126. Representation of a tower encircled by a fanciful design, and the words: **"Callaway Mills."** Tire cord on cones, etc. Callaway Mills, Lagrange, Ga.

309,188. **Columbia.** Pneumatic tires. Pharis Tire & Rubber Co., Newark, O.

309,210. Representation of a tire and thereupon the words: **"Lyne-O-Lyf —Your Safety Signal."** Tires. C. R. Stevenson, New York, N. Y.

309,267. Label containing the words: ***"Rand*** **GUARANTEED** ***'They Last Longer.'"*** and directly below it, the words: **"Washable - Waterproof PREMIER."** Dress shields. Rand Rubber Co., Inc., Brooklyn, N. Y.

309,268. Label containing the words: ***"Rand*** **GUARANTEED** ***'They Last Longer.'"*** and directly below it, the words: **"Washable-Waterproof ZENITH."** Dress shields. Rand Rubber Co., Inc., Brooklyn, N. Y.

309,285. **Cryst Alba.** Naphthalene for rubber compounding. Barrett Co., New York, N. Y.

309,308. **Air Conditioned.** Tennis shoes. Lambertville Rubber Co., Inc., Lambertville, N. J.

309,317. **"John D."** Men's wearing apparel including raincoats. J. H. Daniel, doing business as John H. Daniel Co., Rome, Ga.

309,320. Representation of a nipple. Nipples. R. G. A. Beck, Montreal, P. Q., Canada.

309,340. Representation of a bust of a knight. Heels. Essex Rubber Co., Trenton, N. J.

309,354. **Davis De Luxe.** Tires. Western Auto Supply Co., Kansas City, Mo.

309,372. Square object lined for green. Heels. Essex Rubber Co., Trenton, N. J.

309,408. Black horizontal line crossing a circle in which appears a top hat, cane, and gloves, and the words: **"Genuine Goldbeaters,"** and above the line, the words: **"Pall Mall."** Prophylactic articles. Olympia Laboratory, New Orleans, La.

309,411. Representation of a nipple. Nipples. R. G. A. Beck, Montreal, P. Q., Canada.

309,420. **Peerless.** Electrical wires and cables. General Cable Corp., New York, N. Y.

309,452. **Boomerang.** Golf practice ball returning device. Boomerang Co., Inc., Chicago, Ill.

309,476. **Southland.** Tires and tubes. Benton-Bailey Co., Inc., Richmond, Va.

309,477. **P G.** Brake lining. Raybestos-Manhattan, Inc., Passaic, N. J.

309,489. **Ajed Durable Defies Water.** Shower curtains. J. C. Reznik, doing business as Ajed Textiles, New York, N. Y.

309,499. **Fire-Chief.** Tire valves and caps. Texas Co., New York, N. Y.

309,561. **Fire-Chief.** Inner tubes, tires, tire patches and covers, and brake lining. Texas Co., New York, N. Y.

309,638. Label containing representation of a tire. Tire patches. Fidelity Mfg. Co., Inc., Zionsville, Pa.

309,639. **Beau-Svelte.** Foundation garments. Standard Corset Co., New York, N. Y.

309,647. **Fire-Chief.** Raincoats and boots. Texas Co., New York, N. Y.

309,703. **Tempered Rubber.** Tires. United States Rubber Co., New York, N. Y.

309,726. Double-edged circle containing the word: **"Rialto."** Batteries, Public Service Tire & Rubber Co., Inc., Brooklyn, N. Y.

309,737. Representation of a feather containing the word: **"Fetherwate."** Prophylactic rubber articles. Dean Rubber Mfg. Co., N. Kansas City, Mo.

Market Reviews

CRUDE RUBBER

FACED with a serious strike in the automobile industry and protracted delay in restriction agreement, the rubber market held up well in the 4 weeks to the 24th, with average gains of 20 to 40 points.

The automobile controversy started over the question of recognition of union representatives by the companies. A strike was averted on March 21 when General Johnson and then President Roosevelt intervened. The compromise proposals, however, failed, and the whole affair was referred back to the President, and a strike scheduled for March 26. This was averted by the President who announced the settlement of the controversy on March 25. The terms guarantee the right to collective bargaining; workers may organize into groups; and an impartial board is to be set up by NRA to settle disputes.

A misunderstanding seems to have occurred in the restriction negotiations. An optimistic radio broadcast by H. Colijn, Dutch colonial minister, misquoted in the cable received here, served as a set-back to the market.

What Mr. Colijn actually said was: "My standpoint on rubber restriction is more optimistic than that of the esteemed member of the House, Mr. Rutgers. Also about this rubber question, negotiations are pending, however, so far between interested parties. If and when the interested parties have agreed among themselves about a scheme, they will have to submit same to their respective governments. It depends naturally on the judgment of the governments whether they consider themselves able to take such measures as will be necessary in order to assure a proper working of the scheme."

The Government of the Hague and that of the Dutch East Indies are said to be at odds over several important points, notably native production, and Mr. Colijn is expected to visit the colonies shortly to resolve the points in question.

Production of rubber, meanwhile, continues at a high rate. Even if agreement were finally reached, the date for its enactment would not be immediate, thus allowing further large shipments.

Week ended March 3. Nothing new on restriction happened during the week, and the belief now is that the drastic curtailment necessary is delaying the scheme. But optimism still prevails as to the final result. Akron factories continued to purchase at favorable prices. Quotations slid off, recovered, and ended fairly firm. Sentiment was influenced principally by outside markets, with quotations at the close from 2 to 8 points down.

March closed at 10.43¢, compared with 10.46¢ last week; May 10.70 against 10.78; July 11.00 against 11.06; September 11.24 against 11.32; October 11.36 against 11.38; and December 11.60 against 11.65.

Dr. H. Colijn, Dutch colonial minister, stated that a restriction scheme, it adopted, must be workable for all parties concerned.

"All interested countries, therefore, must cooperate," he said in part, "and even then there will still be various difficulties with regard to the division between European and native rubber. However, negotiations with the foreign interested parties have not been terminated as yet, and I do not want to embarrass our representatives."

Dr. Colijn's statement was discounted both here and abroad. It was also said that on a recent air visit to the Dutch East Indies he attempted to arrange quotas for native output also acceptable to plantation owners.

Shipments from Dutch East Indies last month were 33,738 tons, compared with 17,400 in January, 1933, and 23,037 in January, 1932. For the 3 centers, Malaya, Ceylon, and the Dutch East Indies, production for January was put at 75,381 tons, against 60,783 a year ago, and 59,939, 2 years ago.

Automobile production also is increasing. Last week 71,047 cars were completed, against 63,794 the previous week, and 26,684 in the corresponding 1933 week. Twelve companies increased their output, against 4 showing decreases. The total February figure is estimated at 265,000 to 270,000, far above last year's figure, and the highest since 1930.

The Bureau of Foreign and Domestic Commerce, through Willard L. Thorp, director, estimated that January car sales were about 26% down from the same month last year, but 20% above December, 1933. The delay in getting models into hands of dealers was given as the reason for the drop.

The Outside Market was firm, and business was on a fairly large scale. March ribbed smoked sheets closed at 10½¢, compared with 10⅝¢ a week ago; April-June 10¾ against 10⅞; July-September 11⅛ against 11¼; and October-December 11½ against 11⅝.

Week ended March 10. Rubber prices advanced steadily all week to close with gains of 55 to 75 points. Officials are still silent on restriction, but the trade both here and abroad seems convinced that plans are in the final form and ready to be submitted to the various governments concerned. The American ambassador, Robert Bingham, called on Sir John Simon, Foreign Secretary of Great Britain, early in the week, to ask that the United States be considered before any final agreements about rubber output are reached. It was understood that our Ambassador received these assurances and that Sir John Simon stated that the interests of America and other consuming nations would be considered in future parleys. The later rumors of final agreement could not be confirmed officially.

At the close, March sold at 11.18¢, compared with 10.43¢ the Saturday before; May 11.32 against 10.70; July 11.63 against 11.00; September 11.87 against 11.24; October 11.97 against 11.36; December 12.15 against 11.60; and January 12.25 against 11.70.

Statistics showed gross Malayan exports for February at 57,963 tons, compared with 37,564 in 1933, and 42,008 in 1932. Of this total 19,688 tons were imported from the Dutch East Indies, against 6,167 a year ago. Net Malayan exports, therefore, were 38,275 tons, against 31,397 last year, and 34,000, 2 years ago.

Prices, incidentally, reached the highest point in 4 years on the rise anticipating favorable action on restriction.

Rumors of a restriction agreement brought manufacturers into the Outside Market last week, and sales were in good volume. Prices showed substantial gains over the week before.

March ribbed smoked sheets closed at 11 5/16¢, against 10½¢; April-June 11 7/16 against 10¾; July-September 11 13/16 against 11⅛; and October-December 12 1/16 against 11½.

Week ended March 17. The market surged upward the first 2 days on a favorable restriction statement by Dr. Colijn, but sagged badly the following 2 days on unfavorable reports, leaving the market about where it was. The showing was not bad, considering the weakness in sterling, stock, and other markets. Volume reached 12,380 tons on Monday, 14,680 on Tuesday, 10,400 on Wednesday, and then tapered off.

Prices were 9 points down to 2 points up at the close. March was 11.13¢, compared with 11.18¢ last week; May 11.28 against 11.32; July 11.58 against 11.63; September 11.87 unchanged; October 11.99 against 11.97; December 12.21 against 12.15; and January 12.33 against 12.25.

Dr. Colijn, in a radio broadcast from Amsterdam, said, "It may be expected within a reasonable space of time that the international rubber deliberation will reach a satisfactory conclusion."

Rumors then started in London of a hitch in the negotiations. It was not confirmed, and with the drop in the price of sterling, the market was unable to recoup its losses.

February consumption figures were not up to estimates, but the gain of 87.7% over February, 1933, was impressive to outsiders and brought support into the market. The February total was 40,609 long tons, against 40,413 in January, and 21,638 for February, 1933, according to the Rubber Manufacturers Association. Imports were 31,032 long tons, 32.8% below January, but 64.4% above February, 1933. Domestic stocks at the month-end were 357,094 long tons, compared with 368,660 on January 31, a drop of 3.1% and a further decline of 6.5% from those a year ago. Rubber afloat for the United States was 53,063 long tons, against 45,768 at the end of January, and 32,898 on February 28, 1933.

Dealers' stocks in the colonies on February 28 totaled 44,503 tons, against 42,329 on January 31, and 28,622 on February 28, 1933.

A serious strike is threatened in the automobile industry next Wednesday if differences between the A. F. of L. and manufacturers are not settled. The difficulty is in the alleged refusal of the companies to recognize unions outside of the company and the banning of union representatives. A conference of the executive committee of the National Automobile Chamber of Commerce in New York, the NRA Code Authority in the automobile industry, is to be held March 19. If it fails, union leaders will issue orders to the men to strike Wednesday.

Outside Market business was on a par with that of recent weeks. The imminence of restriction has prompted purchases by manufacturers on a fairly large scale recently; while the upturn in the automobile trade also helped.

Prices were almost unchanged from last Saturday. March was 11 7/16 against 11 5/16; April-June 11 7/16 unchanged; July-September 11 11/16 unchanged; and October-December 12 1/16 unchanged.

Week ended March 24. The imminent automobile strike, while affecting all markets, had the most adverse influence on rubber. Saturday morning a favorable conclusion was announced, but a sudden turn in affairs resulted in an impasse which looked discouraging for the final outcome. The market reacted to the favorable news in the morning, and unless progress is made over the week-end, the market faces a set-back Monday.

Restriction news was of no help in a market already upset by the strike threat. The greatest difficulty now seems to be between native and European planters. The true state of affairs is hard to determine because of the secrecy surrounding the meetings, but it is certain that no effort is being spared to settle the question satisfactorily for all concerned.

Losses of from 13 to 21 points were registered for the week. March closed at 11.00¢, compared with 11.13¢ the week before; May 11.11 against 11.28; July 11.40 against 11.58; September 11.70 against 11.87; October 11.82 against 11.99; December 12.02 against 12.21; and January was 12.12 against 12.33.

February automobile production was 235,376 vehicles in the United States, according to the Department of Commerce, against 106,888 in February, 1933. It was the best figure since August, 1933, when 236,556 units were produced. For the first 2 months output was 396,462 units, against 236,975 in the same 1933 period and 236,762 in the same 1932 period.

Production last week increased sharply in the face of a usual seasonal decline, with 10 manufacturers showing increases. Retail sales are increasing, handicapped somewhat, though, by the delay in making deliveries.

On the basis of figures supplied by the National Automobile Chamber of Commerce the director of the Bureau of Foreign and Domestic Commerce, Willard L. Thorp, estimated that February sales values were 69% higher than those a year ago and 106% higher than in January, 1934. The gain over January sales, Mr. Thorp said, was probably due to the fact that January orders were held over where dealers could not effect delivery.

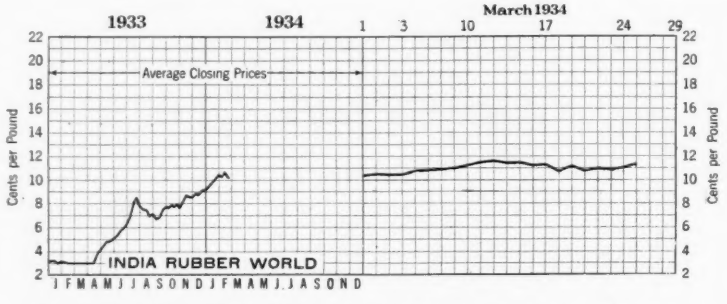
Further statistics show that February shipments from Malaya, the Dutch East Indies, and Ceylon totaled 71,631 long tons, against 52,385 a year ago and 55,887, 2 years ago. For the first 2 months shipments were 147,012 long tons, against 113,168 and 115,826 tons in the same periods a year and 2 years ago, respectively.

The latest reliable restriction news came from Reuter. The main difficulties, it was said, lie between Dutch and British growers over native production, but it was hoped that this obstacle would be overcome. Colijn is scheduled to visit the Dutch East Indies in either April or May in another effort to settle the questions on which the Hague and the Batavian governments are at odds.

The Outside Market was quiet most of the week because of the threatened automobile strike, and the reported settlement on Saturday saw the first good day's business. Prices were down from last week because of the unsettled condition of the market over restriction and the strike.

Nearby ribbed smoked sheets were 11¢ against 11 5/16¢ the week before; May-June 11 1/8 against 11 7/16; July-September 11 1/2 against 11 13/16; and October-December 11 7/8 against 12 3/16.

Opening firm and aided by commission house buying, all based on good news, especially the automobile strike settlement, rubber on March 26 rose more than 30 points before the tone strengthened again near the close, ending the day 10 to 15 points lower than at the previous close. The announcement of a new bill in the Senate to



New York Outside Market—Spot Closing Prices Ribbed Smoked Sheets

New York Outside Market—Spot Closing Rubber Prices—Cents per Pound

	February, 1934									March, 1934													
	19	20	21	22*	23	24	26	27	28	1	2	3	5	6	7	8	9	10	12	13	14	15	16	17
Ribbed Smoked Sheet...	10 3/16	10 3/16	10 7/16	..	10 5/16	10 5/16	10 3/16	10 3/16	10 7/16	10 7/16	10 1/2	10 1/2	10 1/2	10 3/4	10 7/8	10 13/16	11	11 5/16	11 1/2	11 5/8	11 1/2	11 1/2	11 3/8	11 1/4
No. 1 Thin Latex Crepe..	11 7/8	11 7/8	12	..	12 1/8	12 1/8	11 7/8	11 7/8	11 7/8	11 7/8	12 1/8	12 1/8	12 1/8	12 3/8	12 3/8	12 1/4	12 1/2	12 3/4	13 1/4	13 1/4	13 1/4	13 1/4	13	12 7/8
No. 1 Thick Latex Crepe.	11 3/4	11 3/4	11 7/8	..	12	12	11 3/4	11 3/4	11 3/4	11 3/4	12	12	12	12 1/4	12 1/4	12 3/8	12 3/8	12 1/2	12 7/8	13	12 7/8	12 7/8	12 3/4	12 5/8
No. 1 Brown Crepe.....	8 1/8	8 1/2	8 3/4	..	8 7/8	8 7/8	8 3/4	8 3/4	8 3/4	8 3/4	8 3/4	8 3/4	8 3/4	8 7/8	8 7/8	9	9 1/16	9 3/16	9 3/4	9 7/8	9 5/8	9 3/4	9 5/8	9 1/2
No. 2 Brown Crepe.....	8 1/4	8 1/8	8 5/8	..	8 3/4	8 3/4	8 5/8	8 5/8	8 5/8	8 5/8	8 5/8	8 5/8	8 5/8	8 3/4	8 3/4	8 7/8	9 1/16	9 1/4	9 5/8	9 3/4	9 1/2	9 5/8	9 1/2	9 3/8
No. 2 Amber.....	8 3/8	8 1/2	8 3/4	..	8 7/8	8 7/8	8 3/4	8 3/4	8 3/4	8 3/4	8 3/4	8 3/4	8 3/4	8 7/8	8 7/8	9	9 1/16	9 3/16	9 3/4	9 7/8	9 5/8	9 3/4	9 5/8	9 1/2
No. 3 Amber.....	8 1/4	8 1/8	8 5/8	..	8 3/4	8 3/4	8 5/8	8 5/8	8 5/8	8 5/8	8 5/8	8 5/8	8 5/8	8 3/4	8 3/4	8 7/8	9 1/16	9 1/4	9 5/8	9 3/4	9 1/2	9 5/8	9 1/2	9 3/8
No. 4 Amber.....	7 3/4	7 7/8	8 1/8	..	8 1/4	8 1/4	8 1/8	8 1/8	8 1/8	8 1/8	8 1/8	8 1/8	8 1/8	8 1/4	8 1/4	8 3/8	8 7/16	8 3/4	9 1/8	9 1/4	9	9 1/8	9	8 7/8
Rolled Brown.....	6 1/2	6 1/2	6 3/4	..	6 7/8	6 7/8	6 3/4	6 3/4	6 3/4	6 3/4	6 3/4	6 3/4	6 3/4	6 7/8	6 7/8	7	7 1/16	7 1/2	7 7/8	8	7 3/4	7 3/4	7 7/8	7 3/4

*Holiday.

place commodity exchanges under federal control had an adverse effect.

Little factory interest in standard grade rubber was shown. Actuals slipped 1/8¢ during the day.

Sales on March 27 were comparatively light. Easier cables and bearishness sent rubber down 20 points, but a late rally wiped out a good portion of the loss. Spot hardly changed.

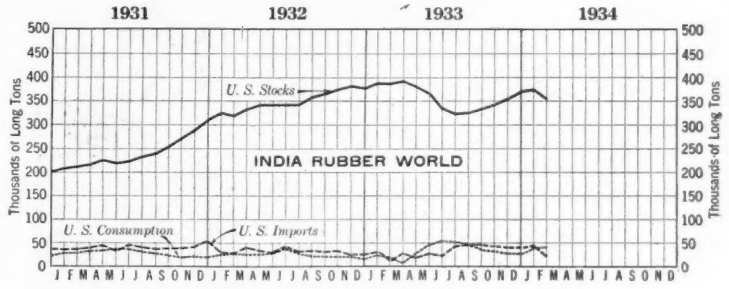
New York Quotations

New York outside market rubber quotations in cents per pound

	Mar. 28, 1933	Feb. 23, 1934	Mar. 26, 1934
Plantations			
Rubber latex...*gal.*	42	50	50
Sheet			
Ribbed, smoked, spot	2 1/8/3	10 3/8	11 1/8
Apr.-June	3 /3 1/8	10 7/8	11 3/4
July-Sept.	3 1/8/3 1/8	11 1/4	11 7/8/11 5/8
Oct.-Dec.	3 1/4/3 3/8	...	12
Crepe			
No. 1 thin latex, spot	3 1/8/3 7/8	12 1/4	12 7/8/13
Apr.-June	3 3/4/4	12 3/4	13 /13 1/8
July-Sept.	3 7/8/4 1/8	13	13 1/4/13 3/8
Oct.-Dec.	4 /4 1/4	...	13 1/2/13 3/4
No. 3 Amber, spot	2 3/8/2 1/16	8 5/8	9 1/4/ 9 3/8
No. 1 Brown	2 1/8	8 1/2	9 3/8/ 9 1/2
Brown, rolled	2 1/8	6 3/4	7 3/8/ 7 5/8
Paras			
Upriver fine	5 3/4	10	10 1/4
Upriver fine	*9	*13 1/4	*13
Upriver coarse	...	6	6
Upriver coarse	*5	*10 1/2	*10 1/4
Islands fine	6	...	9 1/2
Islands fine	*9	*12 3/4	*13
Acre, Bolivian fine	6	10 1/4	10 1/4
Acre, Bolivian fine	*9 1/4	*13 1/2	*13 1/4
Beni, Bolivian	6 1/8	10	10 1/4
Madeira fine	5 7/8	10 1/4	10
Caucho			
Upper ball	4	6	6
Upper ball	6 1/2	*10 1/2	*10 1/4
Lower ball	4	5	5
Pontianak			
Bandjermasin	...	7	7
Pressed block	*5	12	12
Sarawak	...	7	7
Manicobas			
Manicoba, 30% guar.	†2 1/4	6	†9 1/4
Mangabiera, thin sheet	...	6	†9 1/4
Guayule			
Duro, washed and dried	12	12	12
Ampar	13	13	13
Africans			
Rio Nuñez	8	12	12
Black Kassai	7 1/2	10	10
Prime Niger flake	15	18	18
Gutta Percha			
Gutta Siak	6 1/4	10 1/2	10 1/2
Gutta Soh	12	15	15
Red Macassar	1.50	1.50	1.50
Balata			
Block, Ciudad Bolivar	18	40	42
Manaos block	19	32	42
Surinam sheets	28	42	42
Amber	30	47	48

*Washed and dried crepe. Shipments from Brazil. †Nominal.

IMPORTS, CONSUMPTION, AND STOCKS



United States Stocks, Imports and Consumption

United States and World Statistics of Rubber Imports, Exports, Consumption, and Stocks

Twelve Months	U. S. Net Imports* Tons	U. S. Consumption Tons	U. S. Stocks on Hand† Tons	U. S. Stocks Afloat† Tons	United Kingdom Stocks†‡ Tons	Singapore and Penang, Etc., Stocks†‡ Tons	World Production (Net Exports)‡ Tons	World Consumption Estimated‡ Tons	World Stocks†‡§ Tons
1930	**488,343**	**375,980**	**200,998**	**56,035**	**118,297**	**45,179**	**821,815**	**684,993**	**366,034**
1931	**495,163**	**348,986**	**322,825**	**40,455**	**127,103**	**55,458**	**797,441**	**668,660**	**495,724**
1932	400,787	332,000	379,000	38,360	92,567	36,802	709,840	670,250	518,187
1933	411,615	405,687	364,541	55,606	86,438	48,744	845,291	818,370	499,723
1934									
January	46,204	40,413	368,660	45,768	90,272	51,427	81,487	77,200	510,359
February	31,032	40,609	357,094	53,063	.....	.....	.....	.....	.....

*Including liquid latex, but not guayule. †Stocks on hand the last of the month or year. ‡W. H. Rickinson & Son's figures. §Stocks at the 3 main centers, U. S. A., U. K., Singapore and Penang.

World Rubber Absorption—Net Imports

Long Tons

	1933 Nov.	1933 Dec.	1934 Jan.
CONSUMPTION			
United States	29,162	29,087	40,413
United Kingdom	5,737	8,003	5,688
NET IMPORTS			
Australia	301	190	566
Austria	276	402	...
Belgium	1,129	1,360	...
Canada	2,184	1,773	1,721
Czechoslovakia	882	1,772	1,355
Denmark	177	147	114
Finland	111	63	221
France	5,419	5,415	6,843
Germany	4,086	4,933	6,057
Italy	942	1,029	...
Japan	6,296	6,865	...
Netherlands	222	213	381
Norway	107	51	136
Russia	4,483	2,400	...
Spain	493	776	...
Sweden	483	442	714
Switzerland	42	161	156
Others	*1,450	*1,450	*1,450
Totals	63,982	66,532	...
Minus U. S. (Cons.)	29,162	29,087	40,413
Total Foreign	34,820	37,445	...

*Estimate to complete table.

Compiled by Leather-Rubber-Shoe Division, Department of Commerce, Washington, D. C.

CRUDE rubber consumption by United States manufacturers for February, 1934, amounted to 40,609 long tons, against 40,413 long tons for January. This figure is 87.7% over February, 1933, at 21,638 long tons, according to R. M. A. statistics.

Crude rubber imports for February, 1934, were 31,032 long tons, a decrease of 32.8% below January, but 64.4% above February, 1933.

The estimated total domestic stocks of crude rubber on hand February 28 were 357,094 long tons, compared with January 31 stocks of 368,660 long tons. February stocks decreased 3.1% compared with January and 6.5% compared with February 28, 1933.

Crude rubber afloat for the United States ports on February 28, 53,063 long tons, compares with 45,768 long tons afloat on January 31 and 32,898 long tons afloat on February 28, 1933.

London and Liverpool Stocks

Week Ended	London (Tons)	Liverpool (Tons)
Mar. 3	39,680	52,832
Mar. 10	39,670	53,488
Mar. 17	40,174	53,929
Mar. 24	40,178	54,109

New York Outside Market (Continued)

	March, 19	20	21	22	23	24
Ribbed Smoked Sheet	10 3/4	11 1/16	10 3/4	10 13/16	10 7/8	11
No. 1 Thin Latex Crepe	12 3/8	12 5/8	12 1/2	12 3/4	12 3/4	12 7/8
No. 1 Thick Latex Crepe	12 1/8	12 3/8	12 1/4	12 1/2	12 1/2	12 3/8
No. 1 Brown Crepe	9	9 1/4	9 1/8	9 1/8	9 1/8	9 1/4
No. 2 Brown Crepe	8 7/8	9 1/8	9	9	9	9 1/4
No. 2 Amber	9	9 1/4	9 1/8	9 1/8	9 1/8	9 1/4
No. 3 Amber	8 7/8	9 1/8	9	9	9	9 1/8
No. 4 Amber	8 3/8	8 5/8	8 1/2	8 1/2	8 1/2	8 5/8
Rolled Brown	6 3/4	7 1/8	7	7 1/8	7 1/8	7 1/4

Low and High New York Spot Prices

All Prices in Cents per Pound

	1934*	March 1933	March 1932
PLANTATIONS			
Thin latex crepe	11 7/8/13 1/4	3 5/8/3 7/8	4 7/8/4 5/8
Smoked sheet, ribbed	10 7/8/11 5/8	2 13/16/3 1/16	3 /3 1/8
PARAS			
Upriver fine	9 3/4/10 1/4	6 /---	5 /5 1/4

*Figured to March 26, 1934.



SOUND POLICY

Why do the world's leading tire manufacturers rely on

MICRONEX
the King of rubber pigments?

The answer is: it gives them—

1. **Assurance of supply**
2. **Assurance of quality, which means:**
   a. **Uniform rate of cure**
   b. **Uniform reinforcement**
   c. **Uniform milling properties**

The Binney & Smith program of many years' standing has faithfully served the many manufacturers who have relied on it consistently.

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Specialists in Carbon Blacks, Stearic Acid, Iron Oxides, Mineral Rubber and Other Products for the Rubber Industry

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COMPOUNDING INGREDIENTS

RUBBER goods manufacturers made heavy withdrawals of compounding ingredients toward the end of 1933 at the then prevailing prices. These stocks are being gradually reduced; deliveries are now in request on 1934 contracts, and considerably increased demand for supplies is expected the second quarter.

Rising activity in the rubber industry is generally apparent. In Ohio many small plants are operating 24 hours a day on automobile accessories. Tire production has slowed down somewhat, being now at about half capacity and liable to further curtailment in event the threatened strike eventuates in the motor car industry. Hose production is very active; other staple lines of mechanicals are less active, particularly transmission and conveyer belting, demand for which is dependent on industrial plant equipment. Production is reported reasonably good in heels, automobile topping, weatherproof clothing, footwear, general sundries, and other rubber specialties.

The demand is active for rubber chemicals such as accelerators, antioxidants, and colors. Having granted a general 10% increase in hourly rates one important manufacturer of rubber chemicals believes that continued increases in cost of manufacture will finally necessitate price advances of most, if not all, chemical products.

The list of rubber chemicals has been increased by the addition of 3 products: Acrin, super-ultra accelerator especially designed for tire stocks; Retarder-W, an antiscorching preventative; and Sperso, a softener for plasticizing rubber mixings.

CARBON BLACK. Schedules in the rubber trade, showing encouraging increases, indicate that movement will again become normal in about 60 days. Under the carbon black code production must be kept in line with consumption. However sufficient stocks are in the hands of producers to provide a cushion against any demand peaks from consumers.

COLORS. The market for rubber colors is very strong, with a tendency to advance.

FACTICE. The active demand for factice is due to improved conditions of the automobile business and to the uncertainties of legislation at Washington.

RUBBER SOLVENT. The active demand for supplies by the tire industry parallels the demand for tires by the motor industry.

TITANIUM PIGMENTS. The demand for titanium pigments is rapidly increasing by the rubber trade, based on these pigments' superior whiteness and resistance to contact with materials of acid or alkaline characteristics.

ZINC OXIDE. A change in price is scheduled for April 1 amounting to ¾¢ a pound advance on zinc oxide. Contracts on this basis are being offered for the second quarter only. As a result most consumers taking advantage of their first quarter's contracts are getting as much material as their storage facilities will permit.

New York Quotations

March 26, 1934

Prices Not Reported Will Be Supplied on Application

Abrasives		
Pumicestone, pwd.	lb.	$0.02½/$0.04
Rottenstone, domestic	ton	23.50 /28.00
Accelerators, Inorganic		
Lead, white, dry (bbls)	lb.	.06½
Lime, hydrated	ton	20.00
Litharge (commercial)	lb.	.06¾
Magnesia, calcined, heavy	lb.	.04 / .04½
carbonate	lb.	.06 / .06¼
Accelerators, Organic		
A-1 (Thiocarbanilid)	lb.	.21 / .25
A-5-10	lb.	.33 / .36
A-7	lb.	.53 / .65
A-11	lb.	.60 / .75
A-16	lb.	.55 / .65
A-19	lb.	.56 / .75
A-32	lb.	.70 / .80
Accelerator 49	lb.	40 / .50
Acrin	lb.	
Aldehyde ammonia	lb.	.65 / .70
Altax	lb.	
Anhydroformaldehyde-para-toluidine	lb.	
Barak	lb.	
Butene	lb.	
Captax	lb.	
Crylene	lb.	
paste	lb.	
DBA	lb.	
Di-esterex N.	lb.	
DOTG	lb.	.44 / .54
DPG	lb.	.33 / .46
du Pont 808	lb.	
833	lb.	
Ethylidine aniline	lb.	
Formaldehyde aniline	lb.	
Guantal	lb.	.42 / .51
Heptene	lb.	
base	lb.	
Hexamethylenetetramine	lb.	.37
Lead oleate, No. 999	lb.	.10
Witco	lb.	.12
Lithex	lb.	
Monex	lb.	
Novex	lb.	
Pipsol X	lb.	3.55 / 4.00
Plastone	lb.	
R-2	lb.	1.55 / 1.90
base	lb.	4.55 / 5.00
R & H 40	lb.	
50-D	lb.	
Safex	lb.	
Super-sulphur No. 1	lb.	
No. 2	lb.	
Tetrone A	lb.	
Thio	lb.	
Thiocarbanilid	lb.	.20
Thionex	lb.	
Trimene	lb.	
base	lb.	
Triphenyl guanidine	lb.	$0.58 /$0.60
Tuads	lb.	
Ureka	lb.	.62 / 1.00
Blend B	lb.	
C	lb.	.58 / .69
Vulcanex	lb.	
Vulcanol	lb.	
Vulcone	lb.	
ZBX	lb.	
Z-88-P	lb.	.48 / .60
Zimate	lb.	
Acids		
Acetic 28% (bbls.)	100 lbs.	2.91 / 3.16
glacial (carboys)	100 lbs.	14.00
Sulphuric, 66°	ton	15.50
Age Resisters		
Age-Rite Gel	lb.	
powder	lb.	
resin	lb.	
white	lb.	
Albasan	lb.	
Antox	lb.	
BLE	lb.	
Flectol A	lb.	.54 / .60
B	lb.	.54 / .60
H	lb.	
Hiflex B	lb.	
Neozone	lb.	
Oxynone	lb.	.66 / .90
Parazone	lb.	
Permalux	lb.	
Resistox	lb.	.52 / .65
VGB	lb.	
Zalba	lb.	
Antiscorch Materials		
Retarder-W	lb.	
UTB	lb.	
Antisun Materials		
Heliozone	lb.	
Sunproof	lb.	
Binders, Fibrous		
Cotton, flock, dark	lb.	.09 / .13½
dyed	lb.	.50 / .80
white	lb.	.11½/ .18½
Rayon flock, colored	lb.	1.60 / 1.75
white	lb.	1.40
Brake Lining Saturants		
B. R. C. No. 553	lb.	.015 / .017
B. R. T. No. 3	lb.	.015 / .017
Colors		
BLACK		
Bone, powdered	lb.	.05½/ .15
Drop	lb.	.05½/ .17
Lampblack (commercial)	lb.	.08 / .12
BLUE		
Brilliant	lb.	
Prussian	lb.	$0.35½
Toners	lb.	.80 /$3.50
Ultramarine	lb.	.07 / .10
BROWN		
Mapico	lb.	.13
Sienna, Italian, raw, pwd.	lb.	.04¾/ .12½
GREEN		
Brilliant	lb.	
Chrome, light	lb.	.23 / .25½
medium	lb.	.26 / .27½
oxide	lb.	.22 / .23
Dark	lb.	
Guignet's	lb.	.75 / .95
Light	lb.	
Toners	lb.	.85 / 3.50
ORANGE		
Lake	lb.	
Toners	lb.	.40 / 1.60
ORCHID		
Toners	lb.	1.50 / 2.00
PINK		
Toners	lb.	1.50 / 4.00
PURPLE		
Permanent	lb.	
Toners	lb.	.60 / 2.00
RED		
Antimony		
Crimson, R. M. P. No. 3	lb.	.46
Sulphur free	lb.	.48
7-A	lb.	.33
Z-2	lb.	.20
Chinese	lb.	
Crimson	lb.	
Iron Oxides		
Rub-Er-Red	lb.	.09¼/ .10
Mapico	lb.	.09¼
Medium	lb.	
Scarlet	lb.	
Toners	lb.	.80 / 2.00
WHITE		
Lithopone (bags)	lb.	.04½/ .04¾
Albalith	lb.	.04½/ .04¾
Cryptone No. 19	lb.	.06 / .06¼
CB No. 21	lb.	.06 / .06¼
Rayox	lb.	
Titanox-A	lb.	.17 / .18¾
B	lb.	.06 / .06½
C	lb.	.06 / .06½
Zinc Oxide		
Black label (lead free)	lb.	.05¾
Ceramatone	lb.	.06½/ .06¾
F. P. Florence, green seal	lb.	.09¼/ .09¾
red seal	lb.	.08¾/ .08¾

white seal (bbls.)	lb.	$0.10⅝
Green label (lead free)	lb.	.05¾
seal, Anaconda	lb.	.09⅝/$0.09⅝
Horsehead (lead free) brand		
Selected	lb.	.06½/ .06¾
Special	lb.	.06½/ .06¾
XX	lb.	.06½/ .06¾
red	lb.	.06½/ .06¾
Kadox, black label	lb.	.09⅜/ .09⅝
blue label	lb.	.08⅜/ .08⅝
red label	lb.	.07 / .07¼
Lead free (all grades)		
Anaconda	lb.	.06½/ .06¾
Leaded, 5%, Anaconda	lb.	.06¼/ .06½
35%, Anaconda	lb.	.05¾/ .06
Lehigh (leaded)	lb.	.05¾/ .06
Red label (lead free)	lb.	.05¾
seal, Anaconda	lb.	.08⅜/ .08⅝
Standard (leaded)	lb.	.06¼/ .06½
U. S. P. (bbls.)	lb.	.12¼/ .12¾
White seal, Anaconda	lb.	.10⅝
XX zinc sulphide	lb.	.11 / .11¾
YELLOW		
Chrome	lb.	.16
Lemon	lb.	
Mapico	lb.	.09½
Ochre, domestic	lb.	.01⅜/ .02¼
Toners	lb.	2.50
Dispersing Agents		
B. R. V.	lb.	.039 / .041
Bardex	lb.	.023 / .025
Bardol	lb.	.021 / .023
Factice—See Rubber Substitutes		
Fillers, Inert		
Asbestine	ton	15.00
Barytes (f.o.b. St. Louis)	ton	23.00
off color	ton	
white	ton	
Blanc fixe, dry precip.	ton	70.00 /75.00
pulp	ton	42.50 /45.00
Infusorial earth	lb.	.03 / .04
Kalite No. 1	ton	
No. 3	ton	
Suprex, white, extra light	ton	60.00 /75.00
heavy	ton	45.00 /60.00
Whiting		
Chalk, precipitated	lb.	
Domestic	ton	
Hakuenka	lb.	
Paris white, English cliff-stone	100 lbs.	
Sussex	ton	
Witco	ton	20.00
Wood flour (f.o.b. New Hampshire)	ton	21.00 /50.00
Fillers for Pliability		
Flex	lb.	
Fumonex	lb.	.03 / .05½
P-33	lb.	
Thermax	lb.	
Velvetex	lb.	.02 / .05
Finishes		
IVCO lacquer, clear	gal.	2.60 / 2.90
colors	gal.	2.70 / 3.35
Mica, amber	lb.	.03½/ .05
Rubber lacquer No. 106	gal.	3.00
Starch, corn, pwd.	100 lbs.	2.81 / 3.01
potato	lb.	.05¼/ .06
Talc, dusting	ton	15.00 /25.00
Pyrax	ton	
Latex Compounding Ingredients		
Accelerator 552	lb.	
Aquarex	lb.	
Aresco	lb.	.28 / .40
Catalpo	ton	
Colloidal color pastes	lb.	
sulphur	lb.	
zinc oxide	lb.	
Disinfectants	lb.	
Dispersaid	lb.	1.50
Dispersed Antox	lb.	
factice compound	lb.	.26
Emo, brown	lb.	.13
white	lb.	.13
Emulsified Heliozone	lb.	
Igepon A	lb.	
Nekal BX (dry)	lb.	
Neozone L	lb.	
Palmol	lb.	.085
Tepidone	lb.	
Vulcan colors	lb.	
Mineral Rubber		
B. R. C. No. 20	lb.	.015 / .016
Genasco (fact'y)	ton	30.00 /32.00
Gilsonite (fact'y)	ton	37.14 /39.65
Granulated M. R.	ton	
Hydrocarbon, granulated	ton	40.00 /42.00
hard	ton	
soft	ton	
Parmr Grade 1	ton	21.00 /26.00
Grade 2	ton	21.00 /26.00
265°	ton	
Mold Lubricants		
Rusco mold paste	lb.	.12 / .30
Sericite	ton	
Soapbark (cut)	lb.	.07½/ .08
Soapstone	ton	15.00 /25.00
Oils		
Castor, blown	lb.	.12¼/ .12¾
Poppyseed	gal.	1.50 / 1.60
Red, distilled (bbls.)	lb.	.07 / .07⅝
Protective Colloid		
Casein, domestic	lb.	$0.12½/$0.13
Reclaiming Oil		
S. R. O.	lb.	.012 / .014
Reenforcers		
Calcene	lb.	
Carbon Black		
Aerfloted arrow specification black	lb.	.0535/ .0825
Century (delivered)	lb.	.0445/ .0535
"Certified" Cabot	lb.	
Spheron	lb.	
Disperso (delivered)	lb.	.0445/ .0535
Dixie, c.l., f.o.b. New Orleans, La.; Galveston or Houston, Tex.	lb.	.0445
local stock, delivered	lb.	.07 / .08¼
Gastex	lb.	.03 / .07
Kosmos, c.l., f.o.b. New Orleans, La.; Galveston or Houston, Tex.	lb.	.0445
local stock, delivered	lb.	.07 / .08¼
Micronex	lb.	.0535/ .0825
Ordinary (compressed or uncompressed)	lb.	.0535/ .0825
Clays		
Blue Ridge, dark	ton	
China	ton	
Dixie	ton	
Langford	ton	
McNamee	ton	
Par	ton	
Perfection	ton	7.50 / 9.00
Standard	ton	
Suprex No. 1, selected	ton	10.00 /24.00
No. 2, standard	ton	8.00
Glue, high grade	lb.	.23 / .28
Reodorants		
Amora A	lb.	
B	lb.	
C	lb.	
D	lb.	
Para-Dors	lb.	
Rodo No. 0	lb.	
No. 10	lb.	
Rubber Substitutes or Factice		
Amberex	lb.	.13¾
Black	lb.	.06 / .08
Brown	lb.	.07 / .11
White	lb.	.07½/ .12
Softeners		
B. R. C. No. 555	lb.	.012 / .014
B. R. T. No. 7	lb.	.015 / .017
Burgundy pitch	lb.	.05 / .06
Cryst Alba	lb.	
Cumar	lb.	.07 / .09¾
Cycline oil	gal.	.15 / .28
Fluxol	ton	
Hardwood pitch, c.l.	ton	23.50 /25.00
Palm oil (Witco)	lb.	.08
Petrolatum, light amber	lb.	.02⅞/ .03⅛
Pigmentar (drums)	gal.	.23 / .25
Pigmentaroil (drums)	gal.	.23 / .25
Pine oil, dest. distilled (drums)	gal.	.53 / .56
Pine tar	gal.	.23 / .32
Plastogen	lb.	
Rosin oil, compounded	gal.	.35
Rubtack	lb.	.10
Sperso	lb.	
Tackol	lb.	.085 / .18
Tonox	lb.	
Witco #20	gal.	.15
Solvents		
Benzol 90% (drums)	gal.	.25½
Bondogen	gal.	
Carbon bisulphide (drums)	lb.	.05½/ .12
tetrachloride	lb.	.05¾/ .06
Turpentine, wood, dest. distilled (drums)	gal.	.46 / .48
Stabilizers for Cure		
Laurex, ton lots	lb.	
Stearex B	lb.	.08 / .10½
flake	lb.	.07½/ .10
Stearic acid, dbl. pres'd	lb.	.10 / .15
Zinc stearate	lb.	
Tackifier		
B. R. H. No. 2	lb.	.015 / .017
Tear Resister		
Carbonex	lb.	.03 / .035
Vulcanizing Ingredients		
Sulphur		
Chloride, drums	lb.	.03½/ .04
Flowers, extrafine refined, U.S.P.	100 lbs.	
Rubber	100 lbs.	1.95 / 2.70
Telloy	lb.	
Vandex	lb.	

(See also Colors—Antimony)

United States Latex Imports

Year	Pounds	Value
1931	10,414,712	$884,355
1932	11,388,156	601,999
1933	24,829,861	1,833,671
1934		
Jan.	2,521,961	$239,054

Data from United States Department of Commerce, Washington, D. C.

World Rubber Shipments—Net Exports

Long Tons

	1933		1934
	Nov.	Dec.	Jan.
British Malaya			
Gross exports	54,599	57,579	55,276
Imports	20,142	18,110	21,184
Net	34,457	39,469	34,092
Ceylon	6,363	6,966	7,551
India and Burma	516	964	1,531
Sarawak	1,020	989	1,197
British N. Borneo	*750	*750	*750
Siam	1,191	1,046	1,290
Java and Madura	6,684	7,030	6,513
Sumatra E. Coast	9,951	10,183	8,974
Other N. E. Indies	14,474	17,274	17,718
French Indo-China	1,599	2,173	2,158
Amazon Valley	956	930	576
Africa	212	207	*200
Totals	78,173	87,981	82,550

*Estimate. *Compiled by Leather-Rubber-Shoe Division, Department of Commerce, Washington, D. C.*

Foreign Trade Information

For further information concerning the inquiries listed below address United States Department of Commerce, Bureau of Foreign and Domestic Commerce, Room 734, Custom House, New York, N. Y.

No.	Commodity	City and Country
*7,182	Heel making machine.	Grecia, Costa Rica
*7,184	Latex-impregnated paper used as base in making imitation reptile and lizard skins	Zlin, Czechoslovakia
†7,187	Rubber goods	Jerusalem, Palestine
*7,232	Nipples, hot water bottles, ice packs, gloves, syringes, etc.	Vigo, Spain
*7,233	Rubberized cloth for printing machine pressure cylinders	Berlin, Germany
*7,247	Rubber fabrics for sanitary and orthopedic belts	Vendome, France
*7,263	Bathing suits, beach accessories, and rubber sundries	Brussels, Belgium
*7,264	Tubing	Oslo, Norway
*7,266	Paddings and fittings for autobus and trucks	Kristiansand, Norway

*Purchase. †Purchase and agency.

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COTTON AND FABRICS

LEGISLATION pending in Congress, the principal influence on the cotton market this month, was steadying on the whole, with prices about a dozen points down for the last 4 weeks.

The Bankhead Bill providing a tax on excessive production received the greatest attention since it was considered a more effective curb on output than the voluntary agreements by planters. At first the bill was drawn so that 9,000,000 bales would be tax free. Then the limit was raised from 9,500,000 to 10,000,000 bales, with the tax reduced from 75% to 50%. The bill as passed by the House applies to the 1934-1935 and 1935-1936 crops and to the next crop if the President thinks it advisable. The Secretary of Agriculture has the power to fix the amount of cotton to be ginned in succeeding years if ⅔ of the planters agree to continue the plan.

Another bill was introduced in the House which, if it can overcome the opposition to it, should offset the fear of foreign competition. It is the Dies Silver Bill providing for the acceptance of silver in payment of American products at 25% over the world price. On a gold basis it is estimated that American cotton sells abroad for about 7¢ a pound at present. Under the Dies bill would be a further reduction of about 20%, making American cotton 5½¢ a pound at present prices, the lowest that our cotton has sold in foreign markets. Some commentators see in this bill a cure for crop reduction ills. Cheap American cotton would be in demand in foreign markets and would not necessitate the reductions now planned. Objectors see in the bill a form of inflation, and its passage is not assured. The premium of 25% over the world silver price would be absorbed by the government and would be a direct subsidy.

In the cotton goods markets sentiment was not so cheerful as it was last month. The President proposed a shorter work week for employes in cotton mills, which would increase the costs of manufacturers. Future sales of cotton goods, for that reason, have been held up until the situation is clear.

The market has been fairly steady thus far, and the outcome of the various pieces of legislation before Congress will do much to determine the future course of prices.

Week ended March 3. The Bankhead Bill in the House Agricultural Committee provided the trading news for the week. Reports that radical changes were contemplated sent prices down 21 to 26 points on Monday, which were not recovered until Friday when the bill, in a revised form, was reported out by a vote of 2 to one. Gains then of 25 to 29 points left the market unchanged to 5 points higher for the week.

March delivery closed at 12.06¢, compared with 12.02¢ the week before; May 12.17 unchanged; July 12.30 unchanged; October 12.43 against 12.44; December 12.54 unchanged; and January 12.63 against 12.58.

Since a large long interest had been built up in the market in anticipation of the Bankhead Bill, the rumors of radical changes in it caused foreign interests, especially, to release some of their holdings. Later, however, repurchases were made on the release of the details of the bill.

The severe weather early in the week held up cotton goods sales, and, incidentally, interrupted southern wire service. Forwardings to domestic mills were 112,000 bales last week, compared with 114,000 in the previous week, and 96,000 a year ago. But the Bankhead Bill has revived interest in textiles, particularly on Friday and Saturday.

Week ended March 10. The Bankhead Bill, scheduled for debate in the House this week, was put off until next week. Operators received copies of the bill in full for the first time, and the reaction was not entirely reassuring. A large long interest has been built up in the market because of the pending legislation, and the cotton thus held served to keep the market steady.

Prices were 4 points down to one point higher. March closed at 12.06¢ unchanged; May 12.16 against 12.17; July 12.28 against 12.30; October was 12.43 unchanged; December 12.54 unchanged; and January was 12.59 against 12.63.

It was officially reported that returns from the crop-reducing campaign showed that 932,000 growers had contracted to reduce planting by 15,124,000 acres, 38.25% under the base acreage. Planters who received government funds for plowing under part of last year's crop were 100,000 greater than those who signed this year.

Another cause for concern was the President's call for a 10% reduction in working hours. The cotton textile mills are now operating on a 40-hour week. If, as the President suggested, hours were cut to 36 or 30, such action would mean a further increase in costs. This, together with the likely increase in raw material prices, has caused much apprehension in wholesale dry goods quarters.

Planting conditions in the South are reported favorable by the Fosdick Bureau, the sale of fertilizer is about twice that of last year, and the sale of horses and mules also is increasing.

The International Federation estimated that 12,519,000 bales of cotton were consumed by world mills in the first half of the current season, about 637,000 more than in the same period last year. American cotton held by mills was 2,833,000 bales on January 31, against 2,699,000 last year. World consumption of American cotton was 171,000 bales more than the season before. Exports from the United States so far this season are 5,685,000 bales, against 5,812,000 in 1933, and 6,203,000 in 1932.

In the textile market activity was quiet with prices slightly lower. Forwardings were 95,000 bales, against 112,000 the previous week, and 109,000 in the corresponding 1933 week.

Until the Bankhead Bill is out of the way, and action is taken on the reduction program, the market will probably drift along in its present range.

Week ended March 17. The progress of the Bankhead Bill through the House governed the course of prices during the week. The bill was delayed early in the week, and quotations slid off; but when it was brought up later, prices improved. Planting preparations usually hold the interest of traders at this time of year, but until crop control legislation by Congress is out of the way, crop news will loom less importantly. In dry goods quarters, too, buyers are withholding purchases until they know the expected size of the crop.

With all its backing and filling, the market ended the session with prices from one to 5 points down. March closed at 12.04¢, compared with 12.06¢; May 12.15 against 12.16; July 12.25 against 12.28; October was 12.39 against 12.43; December was 12.50 against 12.54; and January was 12.55 against 12.59.

February mill consumption, according to the Cotton Exchange Service, was 470,000 bales, against 441,000 last year. If consumption keeps pace with last year's in the next 4 months until July 1, it will have to increase considerably. Last year in the same period mill consumption was abnormally stimulated by monetary developments, and takings were 250,000 bales monthly higher than in the previous season.

Another matter disturbing manufacturers is the comparatively slight advance in rayon and silk prices compared with those of cotton. With the processing tax and the increase in raw prices, cotton costs to the consumer have risen about 200%, but silk and rayon prices have advanced only moderately. Control legislation may further increase cotton prices, causing an unusually large difference in the cost of the 2 competing materials.

Forwardings to domestic mills last week increased to 144,000 bales, from 95,000 in the preceding week and 64,000 a year ago. Trading in gray cloth was quiet, with unsettlement reported due to the prospects of a shorter work week.

Exports are now 74,000 bales behind those of a year ago. Figures of the British Board of Trade put February cloth exports at 168,000,000 yards,

against 195,000,000 a year ago. The drop represents 93,000 bales less of cotton.

Week ended March 24. The Bankhead Bill passed the House on Monday and served to steady a market subject to liquidation from foreign sources. The agricultural administration reported that 15,152,000 bales would be withdrawn from the next crop under agreements signed by 945,000 growers up to March 14.

Quotations here dropped from 12 to 13 points for the week. May sold at 12.00¢, compared with 12.15¢ last Saturday; July 12.12 against 12.25; October 12.24 against 12.39; December 12.35 against 12.50; and January 12.40 against 12.55.

Forwardings to domestic mills last week dropped to 129,000 bales, compared with 144,000 the previous week and 68,000 a year ago. Prices eased off, and the backlog of orders was said to be smaller, owing to the manufacturers' fear of a shorter work week and their reluctance to enter into future contracts with increased costs likely. For several weeks production has been above consumption.

February cotton consumption, at 477,890 bales, was the highest since 1930. It compares with 441,203 in 1933 and 451,239 in 1932. For January, 1934, consumption was 408,034 bales. For the 7 months of the present cotton year consumption was 3,401,614 bales, against 3,253,149 in the same 1933 period.

Exports in February were 625,457 bales, against 739,352 in January and 557,022 in February, 1933. Exports to date are only 32,000 bales behind those of last year.

The cotton spinning industry operated at 101.5% of capacity during February, compared with 98.5% for January and 95% for February, 1933.

Final ginning figures for the last crop cut the total by 134,000 bales, which requires a revision of the carry-over figures for next season. On the old basis the Cotton Exchange Service estimated a carry-over of 12,046,000 bales, but the new figure is about 11,900,000 bales, or 1,750,000 under that of last year at the same time.

On March 26 cotton futures advanced 12 to 13 points on news of the settlement of difficulties in the automobile industry. The market, however, failing to hold the gains, closed the day unchanged to 2 points off. The tone at the finish was barely steady. Spot sales were nil, and middling ⅞-inch was 5 points off.

Cotton Fabrics

DUCKS, DRILLS, AND OSNABURGS. The demand for merchandise has eased off appreciably during the past fortnight pending adjustment of the midwest situation. This and topics relating to the transportation lines will have to be cleared up before the upward swing of demand and prices will be renewed in a broad way.

RAINCOAT FABRICS. Raincoat manufacturers are showing their spring lines, of which the most outstanding materials are printed seersuckers and printed imitation tweeds.

SHEETINGS. After a very active period of buying that lasted from 7 to 9 weeks culminating the middle of February, the market became quiet with prices slightly easier. Labor troubles, particularly the issue with the automobile industry, can vitally affect the consumption of cotton as well as other commodities; so until these issues are settled a quiet market will prevail.

TIRE FABRICS. Quotations on standard constructions changed March 8 by the following amounts: Karded Egyptian Uppers, down 1¼¢; Karded, 23/4/3, up 1¾¢; 13/3/3, up to 2¼¢; and American peeler cords 1 1/16 inch staple, 23/5/3, up 2¼¢.

WEEKLY AVERAGE PRICES OF MIDDLING COTTON

Week Ended	Cents per Pound
Mar. 3	12.25
Mar. 10	12.38
Mar. 17	12.43
Mar. 24	12.19

New York Quotations

March 26, 1934

	Cents
Drills	
38-inch 2.00-yard ..... yd.	$0.16¼
40-inch 3.47-yard	.09⅞
50-inch 1.52-yard	.23
52-inch 1.90-yard	.18
52-inch 2.20-yard	.16
52-inch 1.85-yard	.18¼
Ducks	
38-inch 2.00-yard D. F. ..... yd.	.16½
40-inch 1.45-yard S. F.	.23
72-inch 1.05-yard D. F.	.33
72-inch 16.66-ounce	.35¼
72-inch 17.21-ounce	.36
MECHANICAL	
Hose and belting ..... lb.	.34
TENNIS	
52-inch 1.35-yard ..... yd.	.24¾
*Hollands	
GOLD SEAL	
30-inch No. 72 ..... yd.	.19½
40-inch No. 72	.21½
RED SEAL	
30-inch ..... yd.	.17
40-inch	.18½
50-inch	.24½
Osnaburgs	
40-inch 2.34-yard ..... yd.	.14¼
40-inch 2.48-yard	.13¾
40-inch 3.00-yard	.11
40-inch 10-ounce part waste	.16
40-inch 7-ounce part waste	.11
37-inch 2.42-yard	.13¾
Raincoat Fabrics	
COTTON	
Bombazine 60 x 64 ..... yd.	.11
Bombazine 60 x 48	.10½
Plaids 60 x 48	.11½
Plaids 48 x 48	.10¾
Surface prints 60 x 64	.12¾
Surface prints 60 x 48	.12¼
Print cloth, 38½-inch, 60 x 64	.07
Print cloth, 38½-inch, 60 x 48	.06¼
SHEETINGS, 40-INCH	
48 x 48, 2.50-yard ..... yd.	.11¼
48 x 48, 2.85-yard	.10
64 x 68, 3.15-yard	.10½
56 x 60, 3.60-yard	.09¼
44 x 48, 3.75-yard	.07¾
44 x 40, 4.25-yard	.06¾
SHEETINGS, 36-INCH	
48 x 48, 5.00-yard ..... yd.	.06½
44 x 40, 6.15-yard	.05¼
Tire Fabrics	
BUILDER	
17¼ ounce 60" 23/11 ply Karded peeler ..... lb.	.42¾
17¼ ounce 60" 10/5 ply Karded peeler ..... lb.	.37¾
CHAFER	
14 ounce 60" 20/8 ply Karded peeler ..... lb.	.42¾
12 ounce 60" 10/4 ply Karded peeler ..... lb.	.35
9¼ ounce 60" 20/4 ply Karded peeler ..... lb.	.42¾
9¼ ounce 60" 10/2 ply Karded peeler ..... lb.	.36
CORD FABRICS	
23/5/3 Karded peeler, 1 1/16" cotton .. lb.	.42¾
23/4/3 Karded peeler, 1 1/16" cotton .. lb.	.43¾
15/3/3 Karded peeler, 1 1/16" cotton .. lb.	.40¾
13/3/3 Karded peeler, 1 1/16" cotton .. lb.	.39¾
7/2/2 Karded peeler, 1 1/16" cotton .. lb.	.37¾
23/5/3 Karded peeler, 1¼" cotton .. lb.	.51¾
23/5/3 Karded Egyptian, Egyptian upper cotton ..... lb.	.54¾
23/5/3 Combed Egyptian ..... lb.	.58¾
LENO BREAKER	
8¼ ounce and 10¼ ounce 60" Karded peeler ..... lb.	.35

*Prices for 1,200 yards of a width or over.

Hakuenka

TESTS reported from the Kyushu Imperial University of Japan on the comparison of properties of vulcanized rubber with the same volume of a half dozen reenforcing ingredients showed results indicating the superiority of Hakuenka for developing outstanding stress-strain test data in vulcanized rubber and increase of its abrasive resistance.

Calcene

THE new rubber reenforcing pigment, Calcene, is giving excellent results in stocks requiring high tensile and resistance to tear and abrasion, particularly when a black stock is not desired and a soft modulus is necessary, together with high physical properties. Calcene is a calcium carbonate pigment of extremely fine particle size that will test 98% under 0.4 micron. Its tensile, tear, and abrasion-resistance values are higher than those of other reenforcing rubber materials excepting the gas blacks.

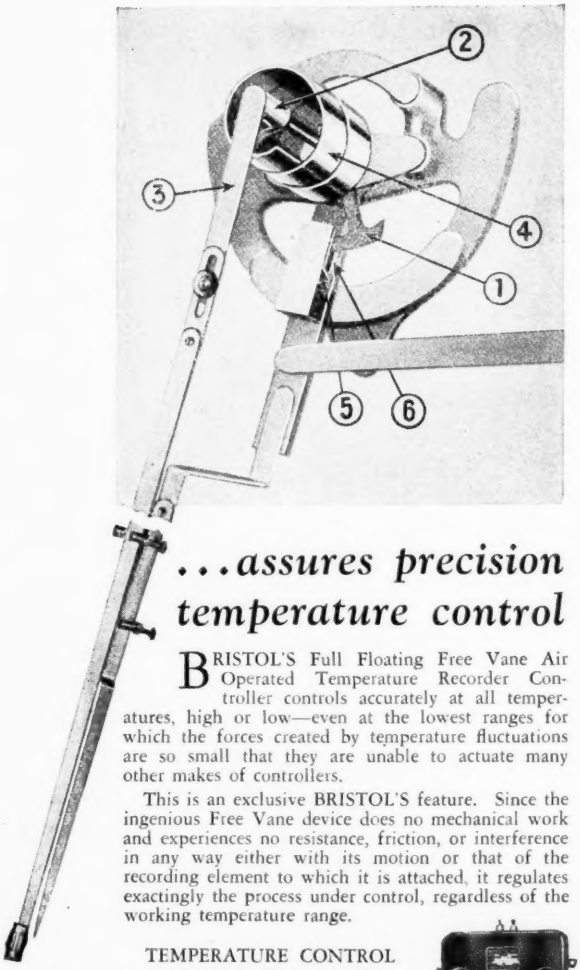
Acrin

THE new accelerator Acrin[1] is made by first reacting hexamethylenetetramine with benzyl chloride and then reacting the product with the sodium salt of mercaptobenzothiazole. During these reactions the components used lose their individual characteristics completely, forming a definite chemical compound that is stable and non-toxic. It is in the form of small light brown pellets that flux readily into rubber during milling. It may be added directly to the batch although it is recommended that all accelerators be used in the form of master batches. It has a slight odor of almonds which persists to a certain extent through cure, but is dissipated with time. It has the bitter taste that is characteristic of all mercaptobenzothiazole derivatives. It is self-activated and produces high modulus stocks of exceptionally broad range cure and excellent aging and heat resisting properties.

[1] U. S. patent Nos. 1,878,654 and 1,878,655.

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TEMPERATURE CONTROL WITHOUT DISTORTION!

A vane (1) is attached to the same shaft (2) as the recording pen arm (3). As the temperature to be controlled varies and actuates the sensitive helical measuring element or flattened metal coiled tube (4), the shaft (2) turns and so causes the vane (1) to pass freely between the two opposing air jets (5) and (6). The discharge of these two nozzles is throttled, and a back pressure is created, which is utilized in effecting control without placing any restraint on the recording and controlling mechanisms.



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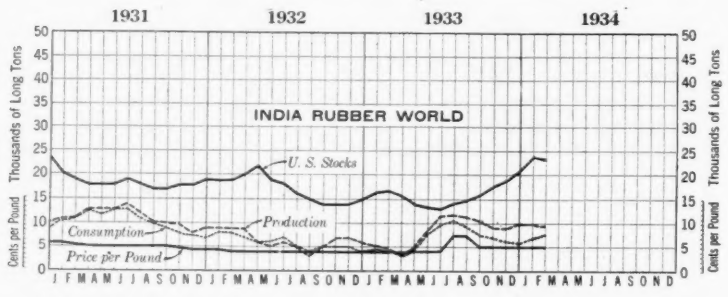
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NEW YORK

RECLAIMED RUBBER



Production, Consumption, Stocks, and Price of Tire Reclaim

United States Reclaimed Rubber Statistics—Long Tons

Year	Production	Consumption	Consumption Per Cent to Crude	United States Stocks*	Exports
1930	157,967	153,497	41.5	24,008	9,468
1931	132,462	125,001	35.7	19,257	6,971
1932	75,656	77,500	23.3	21,714	3,536
1933	99,974	81,612	20.1	20,746	3,583
1934					
January	9,828	7,000	17.3	24,303	333
February	9,504	7,646	18.8	23,356	...

*Stocks on hand the last of the month or year.
Compiled by The Rubber Manufacturers Association, Inc.

CONSUMER demand for reclaims is well maintained in all general rubber manufacturing lines aided by the customary spring seasonal production of specialties. Price advances are supported by increased worth of the various reclaim qualities and the sustained strong position and activity of the crude rubber market.

All prices are firm and nominal. Quotations have advanced on all the more active grades. The NRA code for the reclaiming industry, not yet in effect, will later probably cause further price increases.

HIGH TENSILE. Black advanced ½¢, and red ¼¢.

AUTO TIRE. Black and black selected rose ¼¢ each. Dark gray and white grades are up ½¢ each.

TUBE. No. 1 grade is quoted up 1¢, and No. 2 grade up ½¢.

SHOE, TRUCK TIRE. These and miscellaneous qualities in all grades are unchanged. Mechanical blends are likely to advance soon, being out of line under present conditions.

New York Quotations

March 26, 1934

	Spec. Grav.	Cents per Lb.
High Tensile		
Super-reclaim, black	1.20	8¼/8½
red	1.20	7 /7¼
Auto Tire		
Black	1.21	5 /5¼
Black selected tires	1.18	5¼/5½
Dark gray	1.35	6¼/6½
White	1.40	8 /8¼
Shoe		
Unwashed	1.60	6¼/6¾
Washed	1.50	8 /9
Tube		
No. 1	1.00	12 /
No. 2	1.10	7½/7¾
Truck Tire		
Truck tire, heavy gravity	1.55	5¼/5½
Truck tire, light gravity	1.40	5¼/6
Miscellaneous		
Mechanical blends	1.60	4 /4¼

British Malaya

An official cable from Singapore to the Malayan Information Agency, Malaya House, 57 Charing Cross, London, S.W.1, England, gives the following figures for February, 1934:

Rubber Exports: Ocean shipments from Singapore, Penang, Malacca, and Port Swettenham

	February, 1934	
To	Sheet and Crepe Rubber Tons	Latex, Concentrated Latex, Revertex, and Other Forms of Latex Tons
United Kingdom	10,947	193
United States	30,834	522
Continent of Europe	10,218	452
British possessions	756	15
Japan	3,745	30
Other countries	248	3
Totals	56,748	1,215

Rubber Imports: Actual, by Land and Sea

	February, 1934	
From	Dry Rubber Tons	Wet Rubber Tons
Sumatra	908	8,328
Dutch Borneo	806	6,089
Java and other Dutch islands	207	54
Sarawak	957	48
British Borneo	259	24
Burma	445	40
Siam	557	707
French Indo-China	105	49
Other countries	91	14
Totals	4,335	15,353

RUBBER SCRAP

DEMAND in the rubber scrap market is active, being particularly good for tire and tube grades, certain of which are quoted at moderate advances above the prices of one month ago.

Export trade, particularly in tires and tubes, has been well maintained during the first quarter, and the immediate outlook is favorable for continuance of the demand.

BOOTS AND SHOES. Trade in shoe grades continues active with prices steady and unchanged.

INNER TUBES. All grades are active. No. 1 floating and No. 2 compounded advanced ¼¢, and mixed tubes, ⅛¢.

TIRES. The supply is well maintained, and demand continues to improve. Mixed auto tires with beads have advanced 50¢ a ton. Black auto peelings are up $1.50 a ton.

SOLID TIRES. Solids are scarce, and the supply diminishing. Clean mixed grade advanced from $1 to $2.

MECHANICALS. Trade is dull in mechanicals. Advances in quotations, at $1.50 per ton, are noted only in 2 hose grades: namely, garden hose and steam and water (soft).

HARD RUBBER. The demand is very good for No. 1 hard rubber. The price, however, is unchanged.

CONSUMERS' BUYING PRICES

(Carload Lots Delivered Eastern Mills)

March 26, 1934

	Prices
Boots and Shoes	
Boots and shoes, black....lb.	$0.01¼/$0.01½
Colored....lb.	.01 / .01¼
Untrimmed arctics....lb.	.01 / .01¼
Inner Tubes	
No. 1, floating....lb.	.05½/ .05¾
No. 2, compound....lb.	.03½/ .03¾
Red....lb.	.02¾/ .02⅞
Mixed tubes....lb.	.03¼/ .03⅜
Tires (Akron District)	
Pneumatic Standard	
Mixed auto tires with beads....ton	12.00 /12.50
Beadless....ton	17.00 /17.50
Auto tire carcass....ton	11.00 /12.00
Black auto peelings....ton	21.50 /22.50
Solid	
Clean mixed truck....ton	38.00 /40.00
Light gravity....ton	40.00 /42.00
Mechanicals	
Mixed black scrap....lb.	.01 / .01¼
Hose, air brake....ton	13.00 /14.00
Garden, rubber covered.ton	11.50 /12.50
Steam and water, soft...ton	11.50 /12.50
No. 1 red....lb.	.01½/ .01¾
No. 2 red....lb.	.01 / .01¼
White druggists' sundries..lb.	.01¾/ .01⅞
Mechanical....lb.	.01¼/ .01½
Hard Rubber	
No. 1 hard rubber....lb.	.08¾/ .09

U. S. Crude and Waste Rubber Imports for 1934

	Plantations	Latex	Paras	Africans	Centrals	Guayule	Manicoba and Matto Grosso	Totals 1934	Totals 1933	Balata	Miscellaneous	Waste
Jan. ....tons	44,988	973	182	61	..	..	..	46,204	31,110	73	693	32
Feb.	30,164	750	118	..	..	..	..	31,032	18,875	70	607	..
Total, 2 mos., 1934 ....tons	75,152	1,723	300	61	..	..	..	77,236	....	143	1,300	32
Total, 2 mos., 1933 ....tons	48,530	926	514	15	..	..	..	.....	49,985	24	999	1

Compiled from The Rubber Manufacturers Association, Inc., statistics.

CLASSIFIED ADVERTISEMENTS

SITUATIONS WANTED

FACTORY MANAGER, 15 YEARS' EXPERIENCE manufacturing tires, tubes and molded goods, desires connection with responsible firm. Good background and good references. Address Box No. 347, care of INDIA RUBBER WORLD.

STATIONERS' RUBBER GOODS. PRACTICAL SUPERINTENDent, 20 years' manufacturing complete line rubber bands, erasers, pencil rubbers, molded novelties, tubing, open for position. List of domestic and export trade available. Address Box No. 349, care of INDIA RUBBER WORLD.

SPECIFICATIONS MAN, UP-TO-THE-MINUTE ON tire and tube compounding and specifications, thoroughly familiar with large tire problems as well as passengers. Have had 15 years of general plant experience with best firms. Address Box No. 350, care of INDIA RUBBER WORLD.

MAN, WITH GENERAL EXPERIENCE, DESIRES TO MAKE change. Thoroughly familiar with all details of calender and mill-room work; belt, soles and heels, roll covering, surgical goods, tubing, molded goods, and sponge rubber. Capable of developing new items. Excellent trainer of men. Address Box No. 352, care of INDIA RUBBER WORLD.

TUBING FOREMAN: YOUNG MAN, WITH PRACTICAL EXPERIence in running of tubing department of large druggists' sundries factory manufacturing catheters, colon tubes, rectal tubes, fountain syringe tubing, cord, washers, fine tubing of various sizes, desires position. References. Address Box No. 335, care of INDIA RUBBER WORLD.

FOREMAN OF MILL AND CALENDER ROOMS. EXPERIENCED in compounding mechanicals, tires, tubes, druggists' sundries, and automotive parts. Reputed excellent handler of help. Address Box No. 358, care of INDIA RUBBER WORLD.

SITUATIONS WANTED—Continued

SUPERINTENDENT AND CHEMIST, NOW EMPLOYED. FOR personal reasons wishes change to new organization or small concern desirous of expanding, where financial interest might eventually be purchased. Years of experience all classes press, extruded, and calendered goods. Following. Address Box No. 353, care of INDIA RUBBER WORLD.

GENERAL FOREMAN. PRACTICAL MAN WITH 12 YEARS OF experience in rubberizing all kinds of fabrics, both single and double textures, raincoat materials, and suede cloth. Complete knowledge of calender, mill room, spreading, curing, and compounding. Thoroughly understands the working of all equipment. Address Box No. 354, care of INDIA RUBBER WORLD.

HEATER ROOM FOREMAN: YOUNG MAN, 27, PRACTICAL EXperience in steam and dry heat curing of druggists' sundries, tubing, gloves, dipped goods, hard rubber, bands, etc., desires position. References. Address Box No. 357, care of INDIA RUBBER WORLD.

SITUATION OPEN

WANTED: BY OLD ESTABLISHED HOUSE, CHEMIST WITH complete laboratory rubber mill compounding experience. Write giving full details and salary expected. Your confidence will be respected. Address Box No. 351, care of INDIA RUBBER WORLD.

MACHINERY AND SUPPLIES FOR SALE

FOR SALE: ONE 18 BY 54" BIRMINGHAM 4-ROLL CALENDER; one unused 18 by 30" heavy duty FARREL MILL, chain drive; complete line of W. & P. Mixers, Vacuum Shelf Driers, Calenders, Mills, Colloid Mills, Pebble Mills, Dough Mixers, Hydraulic Presses, Pumps, etc. Rebuilt, guaranteed. What machinery have you for sale? CONSOLIDATED PRODUCTS CO., INC., 13-16 Park Row, New York, N. Y.

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Kenyon Building
57th Street and 1st Avenue Brooklyn, N. Y.
SPECIALISTS IN MECHANICAL MOLDED RUBBER GOODS
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RUBBER MACHINERY
New and Used
LAWRENCE N. BARRY, Inc.
41 Locust Street Medford, Mass.



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Operating, Globe, Angle, or Check Valves—Hydraulic Presses, Accumulators, Pumps, etc.—For almost any size or pressure.
Dunning & Boschert Press Co., Inc.
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BROCKTON TOOL COMPANY
103 BELMONT STREET **QUALITY HEEL MOULDS** BROCKTON, MASS.
MOULDS FOR PLAIN AND SPORT SOLES—MECHANICAL GOODS AND SPECIALTIES

Rebuilt and New Rubber Mill Machinery of Every Type
GUARANTEED EQUIPMENT—PROMPT SHIPMENT
FACTORY OUTFITTERS FROM A BOLT TO A COMPLETE PLANT
Engineering and Erecting Service
L. ALBERT & SON
Warehouses
TRENTON, N. J.
AKRON, OHIO
COMPTON, CALIF.
MAIN OFFICE—TRENTON, N. J.
CABLE ADDRESS
ALBERTSON
TRENTON
We Carry the Largest Stock in the World

(*Advertisements continued on page 77*)

Plantation Rubber Crop Returns by Months

1933	Borneo (26 Companies) Long Tons	Index	Ceylon (102 Companies) Long Tons	Index	India and Burma (21 Companies) Long Tons	Index	Malaya (338 Companies) Long Tons	Index	Netherlands East Indies—Java (60 Companies) Long Tons	Index	Netherlands East Indies—Sumatra (60 Companies) Long Tons	Index	Miscellaneous (8 Companies) Long Tons	Index	Total (615 Companies) Long Tons	Index
January	360	73.6	1,124	55.1	120	21.4	12,467	100.3	2,561	97.5	3,854	95.6	124	68.5	20,610	92.2
February	323	66.1	905	44.3	46	8.2	11,630	93.5	2,703	102.9	4,225	104.8	54	29.8	19,886	88.9
March	319	65.2	992	48.6	126	22.4	10,508	84.5	2,756	105.0	4,177	103.6	93	51.4	18,971	84.8
April	304	62.2	1,242	60.9	139	24.7	10,532	84.7	2,845	108.3	3,844	95.3	121	66.9	19,027	85.1
May	333	68.1	880	43.1	117	20.8	11,879	95.5	2,995	114.1	4,160	103.2	134	74.0	20,498	91.7
June	334	68.3	995	48.8	31	5.5	12,411	99.8	2,965	112.9	4,235	105.0	140	77.3	21,111	94.4
July	354	72.4	1,258	61.6	29	5.2	12,522	100.7	2,919	111.2	4,556	113.0	133	73.5	21,771	97.4
August	369	75.5	1,397	68.4	40	7.1	12,842	103.3	2,449	93.3	4,435	110.0	127	70.2	21,659	96.9
September	373	76.3	1,488	72.9	197	35.1	12,251	98.5	2,443	93.0	4,643	115.2	110	60.8	21,505	96.2
October	388	79.3	1,216	59.6	394	70.1	12,815	103.1	2,824	107.5	4,783	118.6	112	61.9	22,532	100.8
November	412	84.3	1,846	90.4	495	88.1	12,910	103.8	3,033	115.5	4,768	118.3	113	62.4	23,577	105.4
December	389	79.6	1,906	93.4	519	92.3	13,969	112.3	3,095	117.9	4,929	112.2	114	63.0	24,921	111.4
Totals	4,258	...	15,249	...	2,253	...	146,736	...	33,588	...	52,609	...	1,375	...	256,068	...
Monthly Average	355	72.6	1,271	62.3	188	33.5	12,228	98.3	2,799	106.6	4,384	108.7	115	63.5	21,340	95.4
1934																
January	377	77.1	1,424	69.8	408	72.6	12,964	104.3	2,849	108.5	4,436	110.0	129	71.3	22,587	100.2

Note: Index figures throughout are based on the monthly average for 1929=100. Issued February 24, 1934, by the Commercial Research Department, The Rubber Growers' Association, Inc., London, England.

Dominion of Canada Statistics

Imports of Crude and Manufactured Rubber

	December, 1933		Nine Months Ended December, 1933	
Unmanufactured	Pounds	Value	Pounds	Value
Crude rubber, etc.	3,972,148	$300,531	35,491,964	$2,451,576
Gutta percha	.....	.....	5,356	4,382
Rubber, recovered	401,500	14,432	4,167,300	161,278
Rubber and gutta percha scrap	214,000	2,816	2,029,100	33,522
Balata	2,057	584	9,358	4,679
Rubber substitute	24,400	7,113	168,900	35,148
Totals	4,614,105	$325,476	41,871,978	$2,690,585
Partly Manufactured				
Hard rubber sheets and rods	2,035	$983	59,077	$12,415
Hard rubber tubes	.....	270	.....	5,068
Rubber thread not covered	11,288	9,167	90,404	76,315
Totals	13,323	$10,420	149,481	$93,798
Manufactured				
Belting	.....	$3,659	.....	$36,299
Hose	.....	3,850	.....	36,220
Packing	.....	3,647	.....	34,014
Boots and shoes.....*pairs*	285,291	69,578	609,372	193,445
Clothing, including waterproofed	.....	211	.....	7,486
Raincoats .....*number*	660	3,261	5,387	20,181
Gloves .....*dozen pairs*	319	608	2,679	5,896
Hot water bottles	.....	197	.....	14,896
Tires, bicycle .....*number*	410	189	16,561	9,327
Pneumatic .....*number*	212	2,812	10,481	99,605
Inner tubes .....*number*	44	185	1,476	3,836
Solid for automobiles and motor trucks....*number*	22	675	222	6,398
Other solid tires	.....	229	.....	6,291
Mats and matting	.....	4,516	.....	27,826
Cement	.....	4,400	.....	48,406
Golf balls .....*dozen*	94	336	28,178	81,074
Heels .....*pairs*	3,455	246	66,014	2,848
Other rubber manufactures	.....	36,880	.....	462,985
Totals	.....	$135,477	.....	$1,097,033
Totals, rubber imports	.....	$471,373	.....	$3,881,416

Exports of Domestic and Foreign Rubber Goods

	Produce of Canada Value	Reexports of Foreign Goods Value	Produce of Canada Value	Reexports of Foreign Goods Value
Unmanufactured				
Waste rubber	$4,062	.....	$36,917	.....
Manufactured				
Belting	$25,259	.....	$190,144	.....
Canvas shoes with rubber soles	22,652	.....	527,052	.....
Boots and shoes	84,508	.....	1,705,542	.....
Clothing, including waterproofed	6,942	.....	56,795	.....
Heels	5,828	.....	126,517	.....
Hose	8,243	.....	60,960	.....
Soles	10,159	.....	148,447	.....
Tires, bicycle	.....	.....	89	.....
Pneumatic	337,978	.....	2,589,224	.....
Inner tubes	30,274	.....	201,565	.....
Solid	.....	.....	.....	.....
Other rubber manufactures	41,055	$1,225	383,080	$9,038
Totals	$572,898	$1,225	$5,989,415	$9,038
Totals, rubber exports	$576,960	$1,225	$6,026,332	$9,038

Rubber Goods Production Statistics

Tires and Tubes	1933 December	1932 December
Pneumatic casings		
Production .....*thousands*	2,466	1,586
Shipments, total .....*thousands*	2,825	1,455
Domestic .....*thousands*	2,726	1,405
Stocks, end of month.....*thousands*	7,110	6,115
Solid and cushion tires		
Production .....*thousands*	11	7
Shipments, total .....*thousands*	13	5
Domestic .....*thousands*	12	5
Stocks, end of month.....*thousands*	26	24
Inner tubes		
Production .....*thousands*	2,105	1,423
Shipments, total .....*thousands*	2,728	1,379
Domestic .....*thousands*	2,656	1,348
Stocks, end of month.....*thousands*	6,252	5,400
Raw material consumed		
Fabrics .....*thous. of lbs.*	9,986	5,993
Miscellaneous Products		
Rubber bands, shipments.....*thous. of lbs.*	186	138
Rubber clothing, calendered		
Orders, net .....*no. of coats and sundries*	13,818	6,827
Production .....*no. of coats and sundries*	27,074	25,759
Rubber-proofed fabrics, production, total..*thous. of yds.*	1,682	1,772
Auto fabrics .....*thous. of yds.*	306	234
Raincoat fabrics .....*thous. of yds.*	628	707
Rubber flooring, shipments.....*thous. of sq. ft.*	21	252
Rubber and canvas footwear		
Production, total .....*thous. of prs.*	...	4,782
Tennis .....*thous. of prs.*	...	1,603
Waterproof .....*thous. of prs.*	...	3,179
Shipments, total .....*thous. of prs.*	...	4,813
Tennis .....*thous. of prs.*	...	551
Waterproof .....*thous. of prs.*	...	4,262
Shipments, domestic, total.....*thous. of prs.*	...	4,773
Tennis .....*thous. of prs.*	...	168
Waterproof .....*thous. of prs.*	...	4,254
Stocks, total, end of month.....*thous. of prs.*	...	15,016
Tennis .....*thous. of prs.*	...	7,016
Waterproof .....*thous. of prs.*	...	8,000
Rubber heels		
Production .....*thous. of prs.*	13,625	12,433
Shipments, total .....*thous. of prs.*	12,738	13,641
Export .....*thous. of prs.*	322	258
Repair trade .....*thous. of prs.*	3,215	2,423
Shoe manufacturers .....*thous. of prs.*	9,201	10,960
Stocks, end of month.....*thous. of prs.*	37,528	20,337
Rubber soles		
Production .....*thous. of prs.*	4,496	4,647
Shipments, total .....*thous. of prs.*	4,527	5,265
Export .....*thous. of prs.*	3	6
Repair trade .....*thous. of prs.*	281	209
Shoe manufacturers .....*thous. of prs.*	4,244	5,050
Stocks, end of month.....*thous. of prs.*	4,281	2,369
Mechanical rubber goods, shipments		
Total .....*thous. of dollars*	2,848	1,992
Belting .....*thous. of dollars*	627	397
Hose .....*thous. of dollars*	1,015	780
Other .....*thous. of dollars*	1,206	816

Source: *Survey of Current Business*, Bureau of Foreign & Domestic Commerce, Washington, D. C.

Rubber Upholstery

The use of rubber upholstery is not confined to England, and instances of its extension in other countries continue to come to light. The chairman of the crepe sole publicity committee, in company with the Secretary of the R.G.A., recently visited Germany and Denmark for consultations with local interests in regard to publicity in 1934. At the Hotel Terminus in Copenhagen the management offers various types of blankets to suit individual tastes, and, if required, "Hairlok" (rubber treated hair) mattresses can be supplied. *Bull. Rubber Growers' Assocn.*

ERNEST JACOBY

Crude Rubber
Liquid Latex
Carbon Black
Clay

Stocks of above carried at all times

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MELROSE, MASS.

Classified Advertisements

Continued

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IMPORTANT SCRAP RUBBER FIRM APPLIES FOR representation of a firm of large production of this article, established in the United States. Apply to Juan Lopez, Cristina Brunetti, 20, Pasajes (Guipuzcoa), Spain.

A MOLDED GOODS PLANT, LOCATED NEAR DETROIT, WITH A capacity of 1¼ tons daily, can be rented very cheap, or will sell on terms at a low price. We will turn over to buyer $50,000 worth of profitable business. Address Box No. 356, care of INDIA RUBBER WORLD.

MACHINERY AND SUPPLIES WANTED

WANTED: USED LABORATORY OR COMPOUNDING MILL. Send prices and description to Box No. 348, care of INDIA RUBBER WORLD.

SAMPLE *and* PRODUCTION

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FOR THE RUBBER TRADE

HIGHEST QUALITY and MADE TO SPECIAL ORDER

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PATTERN AND MACHINE WORKS, INC.
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Reconditioned 60″ Mill Line of Our Manufacture

5—20 and 22 by 60″ Mills. Line Shafts and Couplings. 500 HP—Herringbone Gear Drive with 40″ Cutler-Hammer Clutch, Brake and Francke Flexible Coupling. 500 HP—G.E. Slip Ring Motor, 514 RPM, 440 V—3 ph—60 cyc—with Control.

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GUARANTEED REBUILT MACHINERY

IMMEDIATE DELIVERIES FROM STOCK

MILLS, CALENDERS, TUBERS, HYDRAULIC PRESSES, PUMPS, VULCANIZERS, TIRE MAKING EQUIPMENT, MOULDS, ETC.

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CABLE ADDRESS "URME"

Crude Rubber
Balata
Pontianac
Gutta Percha

LITTLEJOHN & CO., Inc.
IMPORTERS
133 FRONT STREET NEW YORK

BAIRD

RUBBER & TRADING CO., Inc.

CRUDE RUBBER
AND
LIQUID LATEX

233 Broadway *New York*

United States Statistics

Imports of Crude and Manufactured Rubber

	December, 1933		Twelve Months Ended December, 1933	
UNMANUFACTURED—*Free*	Pounds	Value	Pounds	Value
Crude rubber	88,392,700	$5,869,556	913,510,024	$44,034,064
Liquid latex	2,890,056	270,533	24,829,861	1,833,671
Jelutong or pontianak	1,585,560	143,868	13,416,817	944,895
Balata	93,203	20,008	3,715,720	2,261,869
Gutta percha	29,854	6,171	1,317,693	94,326
Siak, scrap, and reclaimed	618,234	5,025	6,865,923	54,182
Totals	93,609,607	$6,315,161	963,656,038	$49,223,007
Chicle, crude *Free*	612,986	$133,885	4,065,575	$1,081,179
MANUFACTURED—*Dutiable*				
Rubber soled footwear with fabric uppers *pairs*	167,341	$54,456	4,635,162	$792,688
Rubber toys	.....	12,613	.....	391,099
Druggists' sundries, n. e. s.	.....	4,973	.....	41,217
Combs, hard rubber *number*	70,248	3,856	3,320,012	109,853
Golf balls *number*	3,000	877	1,068,440	255,250
Tennis and other rubber balls *number*	21,470	2,576	1,542,154	84,325
Tires *number*	697	1,973	25,572	128,157
Other rubber manufactures	.....	36,280	.....	492,344
Totals	.....	$117,604	.....	$2,294,933

Exports of Foreign Merchandise

RUBBER AND MANUFACTURES				
Crude rubber	4,228,428	$293,690	46,001,985	$2,601,352
Balata	45,103	8,504	226,266	34,783
Guayule	.....	.....	87,500	10,500
Gutta percha, rubber substitutes, and scrap	.....	.....	17,291	3,759
Rubber manufactures	.....	289	.....	17,573
Totals	.....	$302,483	.....	$2,667,967

Exports of Domestic Merchandise

RUBBER AND MANUFACTURES				
Reclaimed	908,476	$37,520	8,022,004	$304,567
Scrap	5,843,730	105,109	48,899,837	751,034
Rubberized automobile cloth, *sq. yd.*	88,315	42,439	730,360	301,691
Other rubberized piece goods and hospital sheeting *sq. yd.*	48,539	19,850	617,557	221,512
Footwear				
Boots *pairs*	6,744	17,648	72,398	136,965
Shoes *pairs*	7,818	5,936	160,278	75,166
Canvas shoes with rubber soles *pairs*	8,241	4,859	277,556	140,790
Soles *doz. pairs*	3,523	5,829	20,368	38,611
Heels *doz. pairs*	41,330	20,087	370,235	188,579
Water bottles and fountain syringes *number*	26,356	8,208	198,038	69,507
Gloves *doz. pairs*	6,696	13,189	66,178	131,202
Other druggists' sundries	.....	28,426	.....	295,079
Balloons *gross*	28,186	25,096	248,728	212,916
Toys and balls	.....	4,076	.....	44,023
Bathing caps *doz.*	7,240	11,612	70,662	115,233
Bands	30,581	8,703	260,844	72,616
Erasers	37,494	22,027	337,481	184,112
Hard rubber goods				
Electrical goods	76,173	8,802	1,025,400	100,368
Other goods	.....	9,535	.....	115,151
Tires				
Truck and bus casings, *number*	26,187	383,969	211,199	3,322,945
Other automobile casings, *number*	106,781	694,625	847,179	5,692,598
Tubes, auto *number*	83,681	81,567	664,040	692,207
Other casings and tubes, *number*	3,592	6,766	25,971	58,413
Solid tires for automobiles and motor trucks *number*	758	21,834	6,839	183,392
Other solid tires	100,527	11,222	1,113,351	121,670
Tire sundries and repair materials	.....	31,469	.....	369,075
Rubber and friction tape	45,782	11,141	599,234	131,616
Belting	186,618	80,470	1,792,608	783,482
Hose	401,032	105,235	3,064,208	826,325
Packing	92,604	35,374	1,017,921	396,075
Thread	86,480	51,687	1,448,396	761,708
Other rubber manufactures	.....	103,548	.....	987,734
Totals	.....	$2,017,858	.....	$17,826,362

London Stocks, January, 1934

			Stocks, January 31		
LONDON	Landed Tons	Delivered Tons	1934 Tons	1933 Tons	1932 Tons
Plantation	6,570	3,617	38,550	36,430	67,129
Other grades	47	45	20	51	37
LIVERPOOL					
Plantation	*2,135	*1,256	*51,702	*52,569	*58,110
Total tons, London and Liverpool	8,752	4,918	90,272	89,050	125,276

*Official returns from the recognized public warehouses.

Rubber Questionnaire

Fourth Quarter, 1933*

	Long Tons			
RECLAIMED RUBBER	Inventory at End of Quarter	Production	Shipments	Consumption
Reclaimers solely (5)	2,475	10,829	11,151	.....
Manufacturers who also reclaim (18)	5,110	15,882	7,594	8,190
Other manufacturers (87)	8,001	.....	.....	9,008
Totals	15,586	26,711	18,745	17,198

	Long Tons		
SCRAP RUBBER	Inventory	Consumption	Due on Contract
Reclaimers solely (5)	24,343	14,402	7,460
Manufacturers who also reclaim (17)	51,108	19,084	9,936
Other manufacturers (14)	215	.....	.....
Totals	75,666	33,486	17,396

Tons of Rubber Consumed in Rubber Products and Total Sales Value of Shipments

PRODUCTS	Crude Rubber Consumed Long Tons	Total Sales Value of Shipments of Manufactured Rubber Products
Tires and Tire Sundries		
Automobile and motor truck pneumatic casings	§50,607	§$53,875,000
Automobile and motor truck pneumatic tubes	8,171	7,589,000
Motorcycle tires (casings and tubes)	‡	‡
Bicycle tires (single tubes, casings, and tubes)	511	582,000
Airplane casings and tubes	10	39,000
Solid and cushion tires	402	649,000
All other solid tires	80	206,000
Tire sundries and repair materials	1,125	2,445,000
Totals	60,906	$65,385,000
Other Rubber Products		
Mechanical rubber goods	6,190	$15,078,000
Boots and shoes	5,720	14,803,000
Insulated wire and insulating compounds	787	†3,529,000
Druggists' sundries, medical and surgical rubber goods	614	1,456,000
Stationers' rubber goods	217	349,000
Bathing apparel	271	96,000
Rubber clothing	159	817,000
Automobile fabrics	184	667,000
Other rubberized fabrics	869	2,744,000
Hard rubber goods	411	¶2,102,000
Heels and soles	3,433	4,197,000
Rubber flooring	154	383,000
Sporting goods, toys, and novelties	302	907,000
Miscellaneous, not included in any of the above items	1,924	3,314,000
Totals	21,235	$50,442,000
Grand totals—all products	82,141	$115,827,000

Inventory of Rubber in the United States and Afloat

	Long Tons	
	Crude Rubber on Hand	Crude Rubber Afloat
Manufacturers	219,358	19,779
Importers and dealers	75,043	36,539
Totals	294,401	56,318

*Number of rubber manufacturers that reported data was 206; crude rubber importers and dealers, 42; reclaimers (solely), 5; total daily average number of employes on basis of third week of Oct., 1933, was 137,260.

It is estimated that the reported grand total crude rubber consumption is 87.2%; grand total sales value, 92%; the grand total crude rubber inventory, 83.2%; afloat figures unavailable; the reclaimed rubber production, 94.6%; reclaimed consumption, 80.4%; and reclaimed inventory, 69.6% of the total of the entire industry.

†Several companies did not report sales value on this item, but did report crude rubber consumption, stocks, etc. Their figures for the fourth quarter have been estimated.

‡Included in automobile and motor truck pneumatic casings. §Includes motorcycle tires (casings and tubes). ¶Figures complete for fourth quarter.

Compiled from statistics supplied by The Rubber Manufacturers Association, Inc.

Imports by Customs Districts

	January, 1934		January, 1933	
	*Crude Rubber Pounds	Rubber Value	*Crude Rubber Pounds	Rubber Value
Massachusetts	8,903,145	$672,294	5,366,318	$182,898
Buffalo	.....	.....	67,200	2,226
New York	84,212,910	5,853,052	54,458,429	1,811,741
Philadelphia	2,108,185	143,111	212,960	6,912,
Maryland	5,556,418	331,424	2,594,738	78,388
Mobile	1,714,809	89,349	505,930	14,055
New Orleans	467,850	25,422	797,452	71,017
Los Angeles	4,755,335	334,139	3,783,733	113,266
San Francisco	600,567	49,319	78,297	2,746
Oregon	13,000	1,040	.....	.....
Ohio	175,129	14,608	101,943	4,909
Colorado	1,450,834	128,419	717,150	26,570
Totals	109,958,182	$7,642,177	68,684,150	$2,314,728

* Crude rubber including latex dry rubber content.